Pests

AND THEIR CONTROL

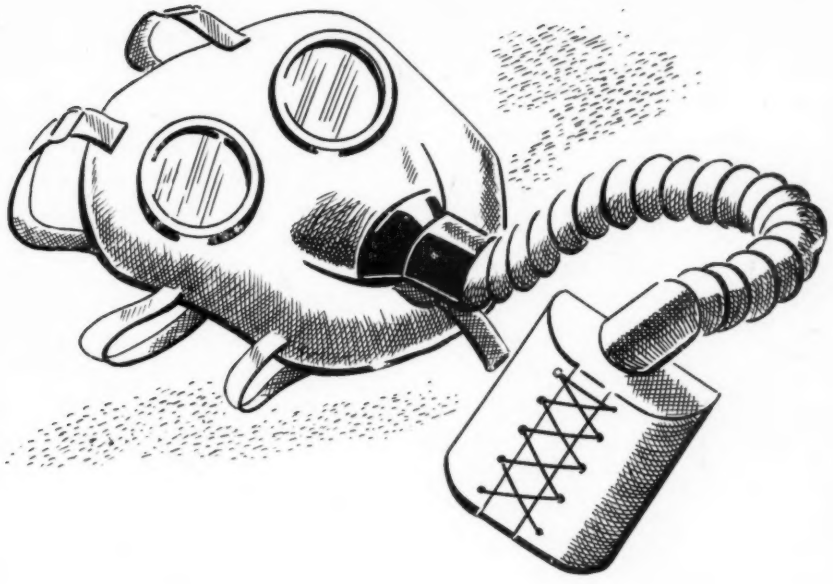
1945

APRIL

VOL. 13 NO. 4

ORGAN OF THE PEST CONTROL INDUSTRY

Exterminators
Fumigators
Termite Control Operators
Entomologists
Insecticide and Supply Mfgrs.



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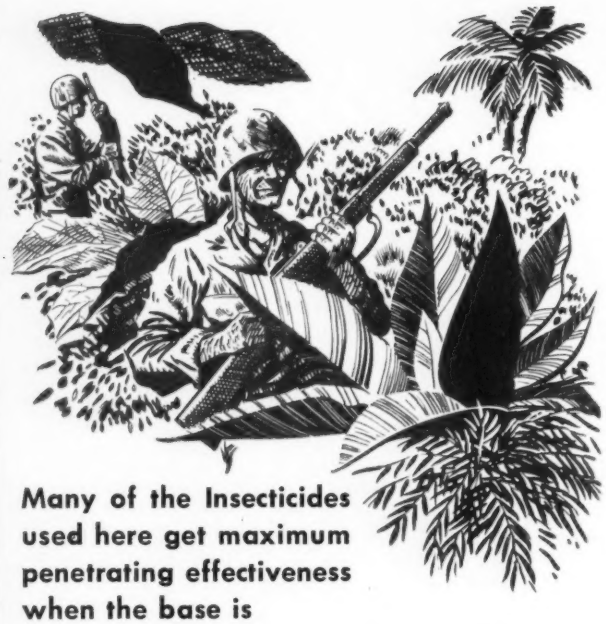

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Pests

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Exterminators, Fumigators, Termite Control Operators, Entomologists, Insecticide and Supply Manufacturers

COOPERATING WITH NATIONAL PEST CONTROL ASSOCIATION

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EDITORIAL

H. G. Irving Sameth
June 20, 1894—March 19, 1945

It is with a deep sense of regret that we inform the Pest Control Industry of the death of our good friend, Irving Sameth. His sterling qualities of leadership in the affairs of our industry and particularly his invaluable services as director and past-president of the National Pest Control Association will be missed in that he always gave freely of time and energy, being keenly interested in seeing our industry attain professional status. He was also active in the affairs of the New York Pest Control Association. There is consolation, in measure, that his spirit will continue to be felt as we carry on with the inspiration he has been to us.

Following in the footsteps of his dad, Irving and his brother, Eugene, and sisters have developed the Sameth Exterminating Company to the enviable position in which the company is held. In World War I, Irving enlisted in the Medical Corps of the U. S. Army, September 17, 1917, and served overseas until honorably discharged June 10, 1919. He then resumed his active part in the affairs of the Sameth Exterminating Company in his capacity as executive vice-president.

Funeral services were held at the Park West Memorial Chapel, New York City, Wednesday, March 21st, at 10:30 o'clock in the morning. Many friends of the industry attended the service.

There have been expressed sincere condolences to his faithful wife, Lillian, and daughters Jane and Ann, residing at 300 Central Park West, New York City. Sympathies have also been expressed to relatives and his associates of the Sameth Exterminating Company.

"You Learn a Lot in a Foxhole"

NOT LONG AGO, while perusing a journal, "Ye Ed's" eyes caught the title phrase, "You Learn a Lot in a Foxhole." That phrase was so impressive that it could be paraphrased as: "PCO's Will Learn a Lot By Becoming Members of the NPCA." Yes, a PCO will learn a whale of a lot if he will take advantage of what the National Pest Control Association offers to every PCO.

The incentive for writing this article is the fact that every so often the NPCA Secretary through his Directives or Service Letters sent out to members, calls attention to various problems as well as obligations. For example, a few weeks ago 82 out of 600 or more members had failed to take care of their 1945 dues. These delinquents are now receiving their Service Letters.

Never has there been a time when PCO's should sense the paramount importance of the NPCA, especially in these days when wartime activities have forced many to change their mode of living as well as their business operations.

It is recognized that if it hadn't been for our NPCA leaders taking steps at the proper time to inform government officials what our industry is doing and point out the importance of the pest control service to the public, where would many be today?

If any PCO thinks that he can operate his business as before and without thought and consideration of what is involved, he has another guess coming. As leaders of our industry are planning and looking forward to postwar business, it is enormously important that every PCO firm that can qualify become a member of the NPCA . . . thus profit by the prestige and service the NPCA renders to its members.

The PCO's job now is to see that he is in good standing and is performing the service that gives satisfactory results to the public, as well as knowing that he can look forward after the war to continuing with absolute confidence that he can expect his clients to demand his services because the enlightened PCO has benefitted from membership in the NPCA.

By following the standards and ideals that the NPCA has so earnestly strived to incorporate into the PCO business, the PCO is assured that he will have the public respect that he deserves.

The challenge comes to each PCO to realize the extreme importance of looking ahead after the war to render even better service than at present. New chemicals and improved technique as well as insect conscious public will demand intelligent services. That challenge is, "PCO's Will Learn a Whale of a Lot By Becoming Members of the NPCA."

Public Co-Operation in Rat Control Asked by Chicago PCO

PHOTOSTAT of a letter from James J. McDaniel, General Manager, International Exterminator Co., was recently featured in the Chicago Herald-American, as part of its campaign for slum clearance and a cleaner city.

In his letter Mr. McDaniel inveighs against the deplorable conditions he has experienced which have made effective rat control almost impossible—conditions, for instance, such as improper garbage disposal, broken basement windows, gaping holes in the foundation, doors torn off the hinges, etc.

Convinced, therefore, that public co-operation is essential and believing that he speaks for all pest control firms in Chicago, Mr. McDaniel concludes his letter with the statement: "We all are anxious to help eradicate and control vermin [rat problem] if and when we receive the necessary assistance." Implicit, of course, in his letter—a good example, incidentally, of effective public relations— is the necessity for ratproofing that may have to be done as part of any control operations serviced by the PCO.

Please Notice

All mail for Pests should now be addressed to our new location—1200 Oak St., Kansas City 6, Mo.

Reprints of Articles

Requests have been made from time to time relative to reprints of articles being available. This publication will make possible reprints of any article in this issue if orders are received within 10 days of receipt of this publication. Charges are based on the length of the article.

Attention

We are sorry that the story and report of the Third Annual Canadian PCO Conference held at University of Montreal, February 19-21, 1945, could not appear in this issue.

The story, report as well as the picture of the group that attended the meeting will appear in the May issue.

A Method of Intelligent Pricing of Pest Control Service

JOHN G. VOGEL, *Philadelphia, Pennsylvania*

Editor's Note: The following paper was presented at the Ninth Annual Purdue Pest Control Operators' Conference, January 16, 1945. *From the Editorial Section of the N. Y. Herald-Tribune.*

DURING THE LAST twenty years I have seen many PCO's come and go. Those who have found it wise to establish a level for themselves and stick to it, have usually remained and become successful, because they have recognized the fundamental fact that there is a relation between price and value. The following is an attempt to analyze this relation as it applies, in my opinion, to the average Pest Control business.

In the past, all Purdue Conferences have been limited to discussions on scientific and technical subjects. This is the first time, to my knowledge, that Professor Davis has allowed us time for a subject of a strictly business nature. Why did he consent to do that? I am sure he is not interested in your profits, but I believe he is definitely interested in the efficiency of your service because that might, perhaps, throw a reflection on him and the Purdue Conferences. I know it would be the saddest disappointment to Professor Davis if those attending his conferences should go back to their home towns and render an inefficient service. One cannot consistently render a satisfactory service unless one receives sufficient returns to operate properly his business.

With all the remarkable progress our Industry has made during the last twelve years since it began to organize itself in points of ethics, research and self-imposed regulations, it still suffers from one hangover which is far from being cured and that is a degree of price consciousness which radiates a fear against charging a legitimate price for legitimate work.

That the NPCA has been conscious of this for a long time is evidenced by the occasional references made to this subject in the service letters, and it is interesting to note from service letter 242, dated February 16, 1942 the following passage:

> "Are you prepared to know all about your business from a financial and business point of view as well as from technical angles? It is granted that you are well aware of the various control measures with reference to pests. However, are you in control of your Profit and Loss figures? No matter how small your firm may appear to be, today a conscientious PCO must know which way he is heading—accurately by facts revealed from his figures. How many times have you asked yourself—"Am I really making progress?" Only basic accounting records will answer that question."

Due to the fact that we have no standardized methods of procedure for pest control service and no standardized procedure of pricing jobs, we are daily confronted with the most astounding variations in price quotations for the same job. Only last month, for example, the Housing Authority of a large city, had invited bids for pest control work on their various projects and when the bids were opened the high bidder was in some instances as much as eight times as high as the low bidder, with the result that the Housing Authority said, "Gentlemen—we are really puzzled. This is an impossible situation and it does not make any sense to us." Now, the chances are that one of these days the Housing Authority may wake up and decide to train their own service crews and the Industry may lose some very desirable business. In short, this sort of thing is detrimental to the reputation of our industry as a whole by creating distrust in the minds of the public and is bound to be harmful to each one of us if we do not find some way of correcting this situation.

If it comes to fumigations we all know that low prices are one of the chief factors which are responsible for so many accidents, because if your price is insufficient you have to cut corners somewhere; you rush through the job, make hasty preparations and are likely to overlook some of the safety features or open up in a hurry with insufficient help and sooner or later somebody is bound to be killed.

Having established a reason for our discussion—let us now take a look at the various factors which enter into the operation of any general pest control business before analyzing more particularly the cost of fumigations. If you will look at the outline in your program you will find a breakdown of these various factors which I have divided into two groups:

1. **Service Costs**
   - a. Materials
     1. Exterminating: Chemicals, Baits, Appliances
     2. Fumigating: Fumigants, Generators, Flashlights, Batteries, Canister, Electric Fans, Sealing Material, etc.
   - b. Labor
     1. Exterminating: Servicemen and Supervisor
     2. Fumigating: Fumigator, Watchman and Supervisor
   - c. Transportation
     1. Exterminating: Carfare, Train, Auto or Truck Exp.
     2. Fumigating: Truck exp., Travelling exp. and time truck is tied up on job.

2. **Selling and Administrative Costs (Overhead)**
   - a. Commission or Sales Costs
   - b. Office Salaries
   - c. Advertising
   - d. Telephone, Lights, Heat and Other Office Maintenances
   - e. Stamps, Stationery and Outside Telephone Calls
   - f. Owner's or Manager's Auto Expense
   - g. Insurance (Pub. Liab., Prop. Damage, Workman's Comp., Auto Insurance, etc.)
   - h. Rent
   - i. Taxes (Social Security, Unemployment Insurance, Income Taxes, etc.)
   - j. License, Permits, etc.
   - k. Depreciation on Trucks and Autos (Wear and Tear)
   - l. Depreciation on Furniture, Fixtures and Equipment
   - m. Incidentals (Freights, Hauling, Bonuses, etc.)
   - n. Bad debts or uncollectable accounts

The first group, the service costs, consists of material, labor and transportation. I have listed a few items entering into these classifications, but of course, they can be broken down in greater detail depending upon a firm's individual operations.

The second group covers overhead costs which I have named "selling and administrative costs" and the various items in this group are listed again in the program. Those of you who do not employ salesmen may feel that they do not have any commission or sales cost. Strictly speaking, this is not correct because somebody has to do the selling and if you do it yourself, your time is even more valuable and must be included in your costs.

How do these various items apply to your own operations? How many of you are making up profit and loss statements every three months or six months or at least once a year? There is not much sense in doing that unless you figure out what percentage each of these items represents on your total volume of business. With the exception of the one man operator conducting his business from his home and using his wife or daughter as secretary, telephone operator and bookkeeper, you will find that the smaller business usually operates at a proportionately larger overhead for the simple reason that the service costs (material, labor and transportation) increase in proportion to the volume of business; you need more labor, material and transportation to do $50,000.00 worth of business than $10,000. On the other hand, most of your overhead items remain fairly stationary. For instance, at a $50.00 per month rental, you can do $50,000.00 worth of business just as well as $10,000. In my own organization I have analyzed the cost sheets of our various operations for a good many years and I have found that on the overall average of medium sized businesses the overhead costs are usually more or less equal to the service costs.

Now that brings us to the most important question; how to arrive at prices? Many of us still use the "rule of thumb" method by merely looking at a job and guessing at some arbitrary figure or others have a set price on fumigations of perhaps $2.00 per one thousand cubic feet or $3.00 per room regardless of how many cubic feet or how many rooms are involved, or they think they

have an idea of their competitor's price. "If he can do it for that price, I can do it for so much less."

From the foregoing it seems to me that it is simple to arrive at a proper price by merely estimating as accurately as possible your service costs (material, labor and transportation). If you then add the same amount to cover your overhead you have a fair chance of breaking even. But since you cannot work unless you eat, you will have to add something for your profit and I would say that it is safe procedure to multiply your service costs by at least 2½ or 3 and then you cannot help but operate at a legitimate profit, providing the ratio betwen your service costs and overhead is essentially 50/50. If, for example, your costs for labor, material and transportation should add up to $15 your charge for the job should range somewhere between $37.50 and $45.00.

Up to now I have been considering only general exterminating service. When it comes to fumigating, which is our main topic, this afternoon, you will have to take other factors into consideration and again I have listed these various factors in the Conference Manual.

a. Fumigations usually interrupt the routine of your service men (unless operators are exclusively fumigators) ..... cost money
b. Personal supervision required ..... costs money
c. Transportation facilities tied up or required ..... costs money
d. Time required for making arrangements (vacating of premises and adjoining bldg., obtaining permits, etc.) ..... costs money
e. Higher cost of Selling (no Renewals or Repeats) ..... costs money
f. Extra Cost for Insurance ..... costs money
g. Possible failures and high cost of refumigation ..... cost money
h. Risks and Hazards ..... cost valuable nerves and sometimes big money

Going back to my original formula of three times the cost of service for general pest control service and taking into account these extra costs involved for fumigation it seems that a safe method to follow for fumigating jobs is to multiply your service costs by three or even better. Of course, this applies to the average small household fumigation and on large scale industrial or commercial fumigations you can afford to reduce this quotient in proportion to the size of the job.

Now it is one thing if your business is specializing in fumigations only, whereby I mean that you do nothing else but fumigating, and your entire organization is geared to that type of operation. But then you will find that the prices of a purely fumigating concern are usually very much in line because in the first place they could not stay in business very long otherwise and secondly they soon realize and take into account all the factors mentioned before and finally every specialist with any degree of success manages to establish a reputation for himself so that price becomes more or less secondary consideration for those who desire a specialist's service.

By the same token you will find that the PCO who engages exclusively in service work, without fumigating, has usually a more favorable balance sheet at the end of the year than his competitor who divides his time between service and fumigations. As one example is worth a dozen arguments I quote again from my own experience: All companies affiliated with my organization have been engaged in both servicing and fumigating with the exception of one, which persistently has kept away from fumigations. Believe it or not, this one company, with practically the same volume of business and the same general overhead expenses as others, has consistently shown a far greater profit for the company and its manager and very much less headache. That seems to indicate that fumigating operations in our industry have, as yet, not reached the point where they can stand on their own financially and are frequently subsidized by the profit made from the general service-work, whether you realize it or not.

Please understand that it is not my intention to advocate that fumigations be abandoned or avoided or even discouraged. To the contrary, they are and must remain a vital part of our industry as long as no safer and less expensive methods are found that are equally effective. But in fairness to ourselves and justice to our customers we must learn to price our jobs sufficiently high to allow for all contingencies. If you under-price a fumigation, and you cannot afford to be charitable and give away money, you will have to cut corners somewhere. Not one corner or two, but perhaps all four corners. You have to cut down in your labor and preparations for the job, in the amount of gas, in the length of exposure to save watchman expenses and in the necessary safety measures. The chances are your job may turn out a failure or, which is worse, you may produce an accident.

If on the other hand your price is adequate you can then, perhaps, use a little extra amount of gas and take care of the job without rushing it and take all your precautionary measures and perhaps give that little extra touch to the job that will please your client and make him recommend you to his friends. As a result you will gain the prestige which spells the word "SUCCESS."

In conclusion let me remind you that any number of attempts have been made in our industry to work out price schedules or minimum fixed prices for both extermination work and fumigation work per room, per apartment, per house, per one thousand cubic feet, and what have you. I am afraid that can never be done. On the other hand, it becomes more and more imperative for those who want to survive in the pest control industry to keep accurate and systematic records of all their operating costs and base their prices on an analysis of expenditures by using some such formula as I have suggested, or something similar to that. This seems particularly easy for fumigating operations because they are more or less standardized for the conscientious operator according to local ordinances and regulations.

It would be ideal if our industry could also succeed in its present effort to standardize to a satisfactory extent the procedures of pest control service. The inevitable result would be stabilization of prices to a reasonable degree and no more such scandalous discrepancies in our price quotations. And, of course, such standardization would also be your best protection against compulsory Legislation.

I have prepared this presentation on the assumption that I am addressing a group of people who are not only scientifically minded, but who are also practical business men, interested primarily in the success of their enterprises. And you know as well as I do that nothing succeeds like success. Most of us, with the help we have received from Purdue and other universities, are capable and well prepared for doing a splendid job which should give us that measure of independence to approach our prospects and customers with a justified pride and to stand up for our rights with an attitude of self-assurance.

In the American Medical Association as well as among members of the American Bar Association, there has developed over a period of time this feeling of pride and spirit of unity and solidarity, which may be called their "Esprit de Corps".

So let us make a concerted effort to strive for this goal, for this same "Esprit de Corps" to dispel public distrust and gain the respect of the public, and for ourselves a keen satisfaction in a dignified profession.

New York State Sanitary Code

Chapter IX—Certain Health Hazards

Regulation 9. Poisonous insecticides and exterminators. The term insecticide or exterminator as used herein shall mean and include any substance containing a poison used for the destruction or control of insects, fungi, vermin, rodents, or other pests, provided that the term shall not include fumigants or products sold for manufacturing or non-insecticidal purposes. The term poison shall mean any drug, chemical or preparation which is liable to be destructive to adult human life in quantities of sixty grains or less. The sale, distribution, possession, or use of an insecticide or exterminator is prohibited unless the container bears a label legibly and conspicuously printed with the word "POISON" and the symbol of the skull and cross-bones in red, together with the antidote therefor and the name and address of the manufacturer, packer, or distributor. Bags, packages, barrels, and drums used as such containers shall have the word "POISON" and the skull and cross-bones indelibly printed, painted or stenciled thereon. The word "POISON" shall be in bold-face type of a larger size than the other wording except the name of the product and of the manufacturer, packer, or distributor.

Insecticides or exterminators in the form of a white powder consisting wholly of or containing arsenic in its elemental form or in any of its combinations or fluorine in any of its combinations if sold, offered for sale, or otherwise possessed or used shall be colored blue, red, or green to an intensity not less than value 8 chroma 4 in accordance with the Munsell System of Color Notation or to a neutral shade corresponding to a value of 7.0 according to said system. Such insecticides or exterminators when intended or used for agricultural purposes need not be colored unless kept, stored, or used in a room in which food is manufactured or prepared or in which powdered food is stored for purposes other than commercial storage or storage in transit.

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BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

BUY AND HOLD WAR BONDS

Some Known Facts Concerning DDT, The Remarkable New Insecticide

E. O. ESSIG, *University of California, Berkeley, Calif.*

Editor's Note: The following paper was read at the Seventh Pacific Coast PC Operators' Conference, Fresno Hotel, Fresno, California, February 23, 1945. Prof. Essig is in charge of Entomology and Parasitology Division, University of California.

DDT or GESAROL. What apears tc be the most outstanding insecticide that has so far been discovered and experimented with is a rather complex chemical compound commercially known by such trade names as DDT and Gesarol. Types of this material compounded for various purposes in the control of insects and in tests on fungi are known by a number of other designations. The insecticide is now being manufactured extensively in Switzerland, England, and the United States and possibly also elsewhere. DDT is a crystalline white, somewhat waxy, synthetic organic chemical compound called dichloro-diphenyl-trichloroethane. It has an obscure and very interesting history, having been first synthesized by a German chemist in 1874 and then forgotten. It was not until 1940 that Paul Muller, in Switzerland, discovered certain insecticidal properties of this little-known and complex chemical. Following some preliminary investigations it was patented to J. R. Geigy Company in Basel, Switzerland, March 7, 1940 and in the United States on Sept. 7, 1943. Two British patents were also obtained by the Swiss company. For insecticidal purposes it was first made available as a spray, containing 5 per cent DDT in water and a sticking agent; and as a dust, containing 3 per cent DDT. In Switzerland a dust containing 5 per cent DDT recommended for killing human lice, was offered for sale as Neocide. It was no doubt introduced into America with the idea and hope that it might serve as a substitute for certain important insecticides like rotenone, pyrethrum, and nicotine, all of which were being set aside almost exclusively for the use of the armed forces. It is a very noteworthy fact that this little-known and possible substitute should itself become the most important among the insecticides sent to war.

Although the first investigations in the use of this chemical as an insecticide were made in Germany and Switzerland, its real worth was not determined until it was placed in the the hands of the research staff of the Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture, October 16, 1942. The material was subjected to almost every conceivable use in the control of all available insects known to infest agricultural crops, domestic animals, and man.

Great discoveries, almost beyond belief, were made especially in the control of mosquitoes, flies, and lice and the possible use of the insecticide in the control of malaria, typhus, and other diseases which were seriously menacing the armed forces. The remarkable killing of body lice and the corresponding control of typhus in Italy by our expeditionary forces after landing in Naples was the first great achievement in the use of this chemical in warfare.

Fortunately, the trials included a great many of the important insects that are known to be troublesome to man in the fields of agriculture, public health, and home economics. Perhaps the most valuable discoveries made in this country have to do with public health and with the control of mosquitoes, houseflies, stableflies, lice, bedbugs, and fleas. While DDT is showing such phenomenal efficiency in controlling many very serious insect pests, it must not be used indiscriminately without possibly incurring serious results even where no harm is thought possible. Since it is a general "all out insect destroyer" it must be borne in mind that all insects are not injurious, that many are very beneficial, and that more than half of the known species contribute to the welfare of the human race. Large groups of bees, wasps, flies, beetles, moths, and other insects are responsible for the cross-pollination of many of our most important food and seed crops; that the great hosts of predacious and parasitic insects are continually exerting a constant pressure on the plant eating and destructive species to maintain a balance of power that enables plant life to exist on this earth; that there are many insects like the honeybee, silkworm, lac scale, and others that produce valuable articles of commerce that amount to millions of dollars in trade every year; and that the major source of food for many land birds and other free living animals, as well as for freshwater fishes, consist of insects. To recklessly kill all these beneficial forms might more than offset any benefits that might be derived from the use of such a destructive and unselective insecticide.

The results of the work done largely by the members of the U. S. Bureau of Entomology and Plant Quarantine during 1943 were summarized and published in the February issue of the Journal of Economic Entomology (Volume 37:125-159, 1944). These included 50 separate experiments with many kinds of insects and these results formed the bases for much greater and more extensive experiments that were conducted, not only by Federal agents, but also by members of Universities, Agricultural Experiment Stations, chemical and insecticide corporations, and other parties interested in the control of insect pests as well as in the manufacture and compounding of different kinds of dusts, sprays, and aerosals.

The manufacture of DDT was gradually greatly increased by the Federal authorities. Whereas it was produced in small quantities by only one or two chemical companies in 1943, during the year 1944 there were added no less than nine companies and by 1945 there were 17 companies, the combined output of which amounts to some 2,000,000 pounds per month, most of which is allocated for use of the armed forces. As a result of the extensive researches that have been made so far, the following generalized statements may be made concerning the new insecticide:

1—It differs from all other known insecticides in its extremely low solubility in water and low volatility. It weathers slowly and therefore offers protection from certain insects for as long as 30 to 90 days. Formulations of DDT may vary greatly in stability.

2—It is a contact insecticide affecting chiefly the nervous system.

3—It is most toxic when ingested by animals, but it may also cause systemic disturbances if absorbed through the skin when dissolved in organic solvents.

4—Dry powders up to 10 per cent may be applied to the skin in body delousing without any apparent injury.

5—It is almost odorless and is apparently tasteless and therefore a rather dangerous poison if handled carelessly. It should be plainly labeled and kept away from foods.

6—A great many experiments have been conducted with regard to its toxicity to experimental animals, but its toxicity to human beings can only be inferred by comparison with such experimental data.

7—It is a specific for many but not for all insects. Orchard mites are not affected, but certain ticks are very susceptible to it.

8—It is almost insoluble in water and is only relatively soluble in organic solvents, ranging from 2 per cent in alcohol and 5 per cent in kerosene, to 50 per cent in cyclohexanone.

9—It is difficult to compound with other insecticides, except with proper types of milling and mixing machinery.

The effects of this insecticide and its various compounds to the internal systems and to the skin of humans and domestic animals was of prime importance since its toxicity to those concerned in its manufacture and in the application of sprays and dusts containing it were unknown when the investigations were begun. Experiments to determine these factors insofar as domestic animals were concerned were conducted by members of the Bureau of Entomology and health officials. The relations of DDT to human health were investigated by Dr. Herbert O. Calvery, Chief of the Division of Pharmacology, Food and Drug Administration and by Dr. Paul A. Neal, Chief, Research Section, Division of Industrial Hygiene of the Public Health Service, both of the Federal Security Agency, and by others. Their results may be summarized as follows:

1—When applied directly to the skin of animals it appears to be non-irritating, nonsensitizing, and nonabsorbant. Concentrations of dust up to 10 per cent DDT, used in dusting clothes for extermination of lice, is apparently not dangerous to health.

2—In solutions of organic solvents and oils it penetrates the skin and causes an irritating, tingling feeling. Ordinary oil solu-

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tions of DDT, as sprays, have had no apparent toxic effects on the operators over several months of continuous spraying exposure.

3—Taken internally, the reactions due to DDT are similar to those caused by phenolic compounds and cause—

1—Loss of appetite.

2—Tremors—mild or severe, of central nervous origin. These can be prevented or stopped by ordinary anesthetics or narcotics.

3—Convulsions and death.

4—Tissues affected by DDT show damage which are neither characteristic nor striking in all cases.

5—Exposure to 1 to 5 per cent DDT in 10 per cent cyclohexanone with 85-95 per cent Freon as aerosals do not appear to offer any serious hazards to health.

In handling DDT the following suggestions are offered to afford the operators the greatest possible amount of safety and protection:

1—Although one milligram of DDT as a dust per cubic yard of air space does not appear to be injurious to human health, the material should be regarded and handled as any other dangerous poison.

2—Mixing operations should be isolated. In making dusts, aerosals, sprays, etc., the drift of dust and vapors especially should be prevented.

3—Concentrations of dusts and aerosals in air should be reduced to a minimum by fans and ventilation.

4—Cleanliness should be observed to prevent intake of vapors. Smoking and chewing should be avoided; frequent laundering of clothing; prevent contact with skin.

5—Wearing masks, respirators and rubber gloves.

6—Avoid contacts with oil solutions of DDT. In non-volatile solvents is absorbed through the skin.

7—DDT is tasteless, and almost odorless. (In general appearance it resembles flour and should therefore never be stored near foodstuffs.)

For the specific control of certain insects it has been most remarkable as indicated by the following examples:

Mosquitoes: including their larvae and pupae, are extremely susceptible to DDT. Experiments have shown that one part of this insecticide in nine million parts of water affect the larvae. In the field control of mosquitoes, especially in the tropics, it has become very effective and most useful. DDT is applied either as a dust or as an oil spray at the rate of approximately 1/10 pound per acre unit of water surface. For the quick killing of adult mosquitoes it may also be volatilized and applied by airplane to large areas thus temporarily completely ridding camps of these malarial transmitters. This method combined with larval and pupal control has afforded great protection to human life. Concentrations as low as 0.2 per cent will prove effective in killing the adults.

Bedbugs: 5 per cent DDT in kerosene applied to 100 mg. per sq. foot has been found effective for 64 days.

Ticks: on dogs and other animals have been killed by a water emulsion prepared as follows: 5 per cent DDT, 6.25 per cent benzene, 1.25 per cent organic emulsifier, and 87.5 per cent water.

Flies: the ever present scourge, in homes, in milkhouses, and in dairy barns, may be killed and kept under control for as long as 103 days by the application of a spray composed as follows and applied inside and also outside of the infested buildings: 1 per cent DDT, 1 per cent pyrophyllite, 0.5 per cent lauryl in water. Smaller quantities as low as 0.2 per cent will give a kill under favorable conditions.

Fleas: on dogs may be killed by a dust composed of 4-5 per cent DDT in pyrophyllite. Protection, however, is only for 4 to 7 days. It is not yet proved to be safe on cats because of the licking and grooming habits of these animals whose skin is also very tender.

Ants: (certain species); **Silverfish** and some **Cockroaches** may be killed by 5 per cent concentrations of dusts or sprays but these seem to be effective only for a short time. As much as 10 per cent may be required for certain species of cockroaches.

Among the important agricultural insect pests that are readily controlled by DDT are earwigs, leafhoppers, certain aphids, plant bugs, caterpillars of many moths, many beetles and weevils, and certain flies.

Pest Problems In The Fifth Service Command *

LT. LEE C. TRUMAN

**This paper was read by Lt. L. C. Truman at the Ninth Annual Purdue Pest Control Operators' Conference, January 18, 1945.*

IT IS A PRIVILEGE for me to speak before this group on the subject of "Pest Problems in the Fifth Service Command." This Service Command, consisting of the states of Ohio, Indiana, Kentucky, and West Virginia, comprises an area in which the pests encountered are those which many of you are called on to control in your private practices. It would be well in the beginning to point out that pest problems in the Army are not fundamentally different than those in private life. They are complicated principally by the factor of a large and ever-transient population.

To take care of its pest control problems, the Army has set up a system of checks and controls which operates in a very orderly manner. The Medical Department has in the Sanitary Corps entomologists one of whose duties it is to inspect Army property for the presence of pests. If inspection discloses an infestation, the Pest Engineer is notified and his crew accomplishes control. The Medical Department thus furnishes advice and recommendations and the Corps of Engineers accomplishes the work. In order to provide more direct control of the work within the Corps of Engineers as well as to provide direct technical advice, an entomologist has been assigned to the office of the Chief of Engineers and one to the Engineer at each Service Command Headquarters. These men assist Post Engineers in planning complete pest control programs for their posts.

Heaviest emphasis in the program has been placed on education and instruction in pest control problems and procedures and on permanent rather than temporary control measures. This policy has paid heavy dividends, not only in manpower and money saved, but in increased interest in pest control throughout the Army. This increased interest and the emphasis on education has not served to reduce the amount of control necessary. Rather, the amount of work being done has increased tremendously, the savings being accounted for in reduced costs per unit of work and in increased efficiency of operating personnel. Army personnel is becoming increasingly pest conscious. Infestations of such things as bedbugs and cockroaches that were formerly tolerated are now eliminated quickly. Many men who used to be accustomed to living with these pests have learned how comfortable it can be living without them. It is not too much to expect that large numbers of these men will carry this dislike of living with vermin back into their private lives after the war and thus add to the amount of work available to the commercial pest control operator.

Army pest control was first concerned with pests only as they caused disease and thus affected the health of troops. The present program, however, is designed to protect both the health and the morale of troops and thus constitutes true pest control.

In the Fifth Service Command, our biggest pest problem at the beginning of the present war was, of course, the protection of large bodies of troops from the attacks of disease-carrying pests. These troops, assembled from all parts of the country, brought with them their own particular varieties of vermin, however it was not with these that we were immediately concerned. Large numbers of our camps were newly constructed and, fortunately, free of so-called household pests for some time after initial construction. However, many of our camps were located in areas in which excessively high counts of potentially malaria-carrying mosquitoes were recorded. Although malaria was not present in epidemic proportions in the region of any of our camps, the constant interchange of men from one part of the country to another presented the ever-present danger of bringing in infected individuals. This, together with the fact that there was always a certain rather sizeable but not accurately measurable amount endemic among the civilian population surrounding our reservations, made an effective malaria control program a "must" at each Army post. These programs were initiated with vigor first as malaria control programs and later as mosquito control projects. This change was due to the fact that it soon became evident that a high concentration of pest mosquitoes could so disturb a body of troops as to seriously interfere with their training. Mosquito control has been accomplished largely by an effective drainage program which removed a large portion of the suitable mosquito breeding places on our posts. Larvacide is applied to the remaining standing water

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surface at regular intervals throughout the breeding season. Old wells and cisterns were filled in or covered and small sheds and farm buildings torn down principally as a method of removing daytime resting places for adult mosquitoes. This program has been so effective that on most posts the adult malarial mosquito count is close to zero while on at least one of our large posts it has been very difficult to find adults of any kind of mosquitoes.

Flies, also, constituted a menace to the health of troops particularly in the newly constructed camps. Most of these camps were built on what formerly was farmland. Old barns and stables for the most part were still standing and manure piles and ground polluted from them were common throughout most of the areas. Camps were built and hastily trained mess personnel placed in charge of mess halls. In the resultant confusion many insanitary conditions developed in the vicinity of mess halls particularly at the garbage racks. The flies that developed from these polluted areas were not only severe pests—they also constituted a very serious hazard to health. Of course all normally required screening was done. This, however, did not offer a complete solution to the problem. As in all proper fly control, a complete cleanup of all polluted areas and soil was necessary. Manure piles were removed and their contents spread. The areas polluted by the original piles were treated with heavy oil. Around the mess halls it was found that oil, either No. 5 diesel or waste crankcase oil, when applied to loosened soil subject to repollution would effectively prevent fly breeding for from three to four months. Oil applied to unloosened soil under the same conditions was not effective for more than a two week period. Also, it did not soak into the ground properly and was tracked inside the building by the mess personnel. Properly loosened soil absorbed the oil readily and increased the evaporation surface of the ground so that the area around the racks remained dry.

Fly sprays containing, principally thanite or lethane, are issued to troops for use in their buildings. These are excellent sprays but are worthless unless suitable breeding control is used outside the buildings. Trained personnel on all posts use 5% DDT in fly control. This material applied to surfaces where flies normally alight, leaves a residue which will kill adult flies over a period of several months.

Bedbugs have been a major problem. Men travelling all over the country, in all kinds of conveyances, and stopping in all kinds of lodgings, have brought in bedbugs sometimes in almost unbelievable numbers. Even in camps in which all of the buildings were new only two or three years ago, heavy infestations have been found. Practically every possible method of eradication has been used. Superheating of buildings will kill those bugs which are on the inside. However, it has been amply demonstrated that in such loosely constructed structures as the average Army barracks a large number of the bedbugs in any heavy infestation will be outside the building, hiding in cracks in the wood there. This is particularly true during the summer months when our infestations are heaviest. There are certain other disadvantages to the method, chief of which is the ever present and all too real danger of burning down the building together with its contents.

GI flyspray consisting of kerosene and 5% thanite or lethane, has been tried as an exterminating medium and has proved to be very successful wherever it has been properly applied. Two or three applications of about five gallons per 74 man barracks made at weekly intervals will serve to eliminate all bedbugs from the walls and beds. A pressure sprayer must be used to assure that the material is blown into the hiding places of the insects with enough force to assure that each bedbug is wet with the liquid. With this method of control, however, special attention must be given to the treatment of mattresses, bedding, and equipment which may also be infested. Such objects as a gas mask bag are favorite hiding places for bedbugs and because of the fact that they contain rubber cannot be sprayed with kerosene. For this reason, the usual method of treating such articles has been to run them through a high pressure steam autoclave. In very hot summer weather, bedbugs can be eliminated from beds, bedding, and clothing by exposure to the hot sun for several hours. As all of these procedures are rather lengthy, this method of control is not much in favor. As an aside on this type of control, an experimental run was made using plain deodorized kerosene in the same quantities and in place of the fly spray. Excellent control was obtained with this method.

Fumigation with HCN has been the standby for bedbug control for some time now. Standard methods of application have been used with the exception that a quantity of only about five ounces per thousand cubic feet of air space was used instead of the normally higher quantity used in commercial work. This quantity has proved, in our type buildings, to be entirely adequate. In this Service Command at least, there have been no instances where control was not obtained with this amount.

A 5% solution of DDT applied as a spray to walls, beds, and mattresses leaves a residue which kills bedbugs for periods up to a year and a half.

Roaches are a perpetual problem in Army camps. Theoretically, good housekeeping should keep roaches out of a building. After all, if there is no suitable food present, there should be no attraction for them. However, it is not always possible to maintain a degree of cleanliness sufficient to prevent infestation. Use of sodium fluoride powder has been very satisfactory in killing the roaches that are present in a building, complete kills being possible overnight. DDT powder is as effective as, but no better than, sodium fluoride. The residue from a 5% DDT solution does not give good roach control. In spite of excellent control with powders, reinfestation in mess halls continues. Practically every bag of potatoes or every sack of onions brings its new population. These commodities are infested when they reach our camps. Just where they became infested I do not know but it would seem that there is a good opportunity for the commercial operation to do some additional work in food warehouses over the country.

In spite of the fact that termites are common in the Ohio Valley, we have not been bothered much with them. This is due principally to the fact that our buildings are generally built free from the ground with no continuous foundations under them. This permits free circulation under the building as well as making it easy to inspect for termite tubes and damage.

Rats and mice are present in large numbers about many Army establishments. Field mice, no longer having barns and stables to go into during cold weather, make a nuisance of themselves during the early winter months by invading barracks in large numbers. They do not usually cause any great damage but their persistent chewing on almost everything is annoying. Control has been most easily achieved by using ordinary snap traps. The mice will eat almost any bait offered them or can often be caught in traps that have not been baited at all. Phosphorous pastes, arsenic, or zinc phosphate mixed with suitable foods are sometimes made into torpedoes and left in such places as behind cupboards where mice can easily reach them but where there is little danger of pets or of people eating them. Usually, however, poison has not been used on mice.

Rats have appeared at many stations at various times. However, very close watch is kept for rat infestations and at their first appearance measures are put into effect to control them. Trapping is effective but usually involves too much labor. A preferred method of control is prebaiting followed by the use of poisoned baits. Where pets are present, it has been necessary to confine the poisoned baits to bait boxes. These boxes are made about twenty inches to two feet long and so constructed as to have an inside size of about two by four inches. They are left open at both ends. A door is built into the top of the box so that bait can be placed half way between the two openings. As the openings are small enough that pets and most wild animals cannot reach the bait, there is very little danger of their being poisoned. Further, rats seem to prefer to feed in the boxes and take larger quantities of bait out of them than are taken if the baits are left exposed.

All of these methods of control are exceedingly simple. The fact that in a great number of instances we have been forced to use inexperienced personnel to accomplish the work has made it necessary for us to adopt simple methods which could be easily learned. We have served as an extensive proving ground for the old axiom that "The method or material used in pest control is no more important than its proper application". Whenever the application has been well planned and thorough, control has been effective.

Several of the types of pest control used in the Army offer fields that can well be adapted to the use of the commercial operator. Mosquito control, for instance, is a type of pest control that should find a ready market among the civilian population. It is not at all impossible, or even too difficult, to remove the mosquito nuisance from an area such as a country club or a health resort. This type of work could quite easily be handled either on a basis of actual accomplishment or of technical advice to others who will accomplish the work themselves.

The uses of DDT in insect control have been widely tested by the military services and, for many insects, this material has provided an easy method of control. DDT has been restricted for military use alone ever since its discovery as an insecticide. There is some hope that within the next year or so it may become available for the use of commercial operators. The material is toxic and it is not known as yet whether it is safe to sell it in effective concentrations over the counter as a household insecticide. Probably the use of DDT as a bedbug killer will result in the loss of a considerable portion of the household fumigations now being done. However it should open up new work that could not be done in the past due to the natural reluctance of householders to having their neighbors know they had "bugs".

DDT has been made available for use on Army installations in the continental United States only within the past several months.

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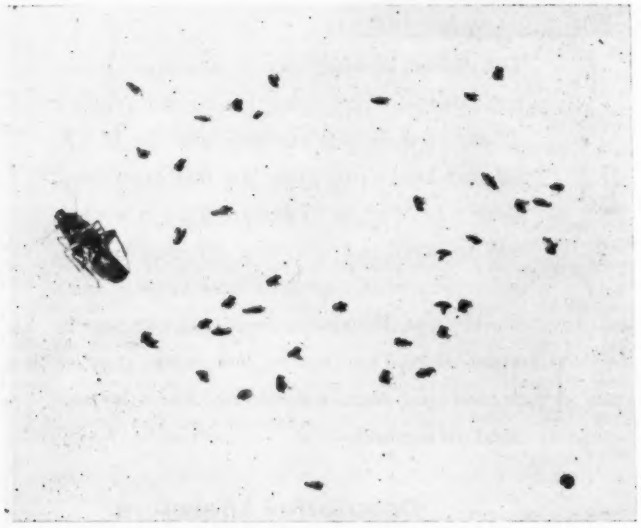
Already it has made important changes in some of the methods of control that have been outlined previously. For the first time in control of mosquitoes and flys, it is possible to direct effective control measures against the adult insects. Breeding control is still being emphasized but with the concurrent use of adult control a far better job can be done. For the first time, it is possible to practice prophylaxis in bedbug control. It is no longer necessary to wait until someone calls in to make a complaint and then to rush out and do an "exterminating" job. Now, buildings in areas subject to infestation can be treated and the bugs prevented from ever appearing.

In all of this program of control there has been no inclination on the part of the War Department to take business away from the commercial operator. However, the volume of work that had to be done on Army posts was becoming so very large that it was a major item of maintenance. In a great many instances commercial operators could not be obtained to do a fumigation without waiting for three or four weeks. As the Army is intended to be as self-sufficient as possible and as it has always been the practice to train Army personnel to do any work that had to be done in volume, crews were trained on every post where extensive work needed to be done. On all of our smaller stations, commercial contracts are still let. In each case where a contract is to be made, investigation is made by Service Command Headquarters as to the reliability of the firm to be engaged. This is not intended as an inquiry into the business operation of any firm but it as a safeguard against accidents on Army posts. This has been necessary by the fact that in the large majority of communities in the four states comprising our Service Command, there is no regulation as to who may fumigate or use poisons or even as to whether or not the operator knows how to handle fumigants and poisons safely. For this reason investigation must be made by ourselves. Our principal concern is that an operator do a thorough job using proper safety precautions. To date, there have been no accidents due to pest control activities on posts in the Fifth Service Command.

German Roach and Her Nymphs



Here shown are one dead female (German) roach, the aftermath of a control operation, and thirty-seven of her nymphs. Nothing unusual about this thus far—but what does make it unusual, however, is the fact that the nymphs were hatched immediately after the death of the female parent, according to A. H. Hargis, of the Red Demon Exterminating Co., Houston, Texas. In support of this he calls attention to the egg case still attached to the female roach, noting that unless it were fully matured it would not have hatched immediately after the death of the parent. Moreover, asserts Mr. Hargis "not once, but many times" has he witnessed eggs hatched directly after they were deposited by the female (German) roach.

Of pertinent interest, apropos Mr. Hargis' report, are some comments by Dr. Geo. E. Gould, Associate in Entomology, Purdue University, Agricultural Experiment Station, Purdue University, Lafayette, Ind. Says Doctor Gould: "I think Mr. Hargis has perhaps confused the egg-laying and depositing habits of the various roaches. All common species of roaches deposit their eggs in cases known as ootheca or capsules, and the American, Oriental and brown-banded species drop or deposit the capsule within 24 to 72 hours in some out-of-the-way place. These eggs will hatch 30 to 120 days later—depending upon the species and the temperature and relative humidity of the hiding place. On the other hand, the German female deposits the eggs in the capsule and continues to carry it for 20 to 40 days—depending upon temperature and relative humidity. At that time the eggs may hatch with the capsule still attached to the female (as in the picture), or the capsule may be dropped and hatch within a few hours.

"Certain insecticides, notably pyrethrum, cause a paralysis of the roach, which results in the female releasing the egg capsule. For instance, a pyrethrum spray may kill the female German roach, but her capsule may be released and hatch several days after her death if moisture conditions are favorable. Capsules removed manually from the female more than 72 hours before normal hatching time will seldom hatch properly and even then must be held at the proper conditions of moisture and temperature."

Concentrations of Sodium Fluoride-Flour Mixtures for Silverfish Control

ARNOLD MALLIS, *University of Delaware, Newark*

Pest control operators often use a bait containing sodium fluoride and wheat flour for the control of silverfish. An experiment was conducted in the laboratory in Los Angeles in order to determine what concentrations of the sodium fluoride-flour mixture were most effective against **Ctenolepisma urbana** Slabaugh.

Traps were prepared as previously described (Mallis, 1941) by binding the outside surface of one ounce salve jars with scotch masking tape. A teaspoonful of the material being tested was placed in each trap. These traps were then distributed beneath an auditorium in West Los Angeles which was badly infested with **Ctenolepisma urbana**. The jars were removed at 24 hour intervals, and those containing C. **urbana** were kept at room temperature during the observation period. The results are indicated in table 1.

Table 1.—Mean length of life, in days after entering trap, of Ctenolepisma urbana exposed to varying concentrations of sodium fluoride in a sodium fluoride-flour dry mixture.

Formulation	No. of Silverfish	Life in Days After Entering Trap[1]
Flour check	55	27.4
1 NaF:99 Flour	62	10.6
3 NaF:97 Flour	51	6.7
5 NaF:95 Flour	58	4.3
7 NaF:93 Flour	64	5.6
9 NaF:91 Flour	51	4.4
10 NaF:90 Flour	26	3.9
30 NaF:70 Flour	29	5.2
50 NaF:50 Flour	25	4.6
70 NaF:30 Flour	25	4.0
90 NaF:10 Flour	25	3.9
100 NaF	10	4.7

[1]4.1 days required for minimum significance (determined by J. C. Elmore).

It will be noted that there is no significant difference in concentrations above 1 per cent sodium fluoride, and that the mean length of life after entering trap varied relatively little at concentrations above 5 per cent sodium fluoride. On the basis of these results it is recommended that the sodium fluoride-flour mixture contain no more than 5 per cent sodium fluoride. Many of the baits now in use contain as much as 30 per cent sodium fluoride.

Experience in silverfish control has shown that for best results the dry bait should be thoroughly mixed and then distributed in "pinches" at 1 to 3 foot intervals behind molding, in cracks and crevices, in the corners of book cases, etc. Application of this mixture in several badly infested buildings apparently gradually decreased the silverfish population.—8-22-44.

LITERATURE CITED

Mallis, A. 1941. Preliminary experiments on the silverfish Ctenolepisma urbani Slabaugh. Jour. Econ. Ent. 34: 787-91.
—*Jour. Econ. Ent., December,* 1944.

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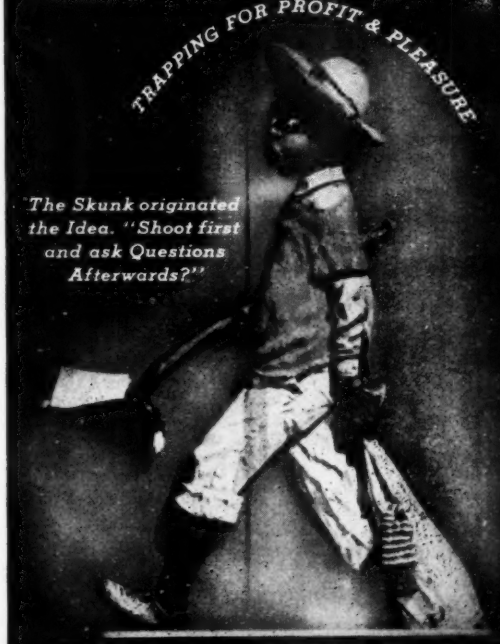

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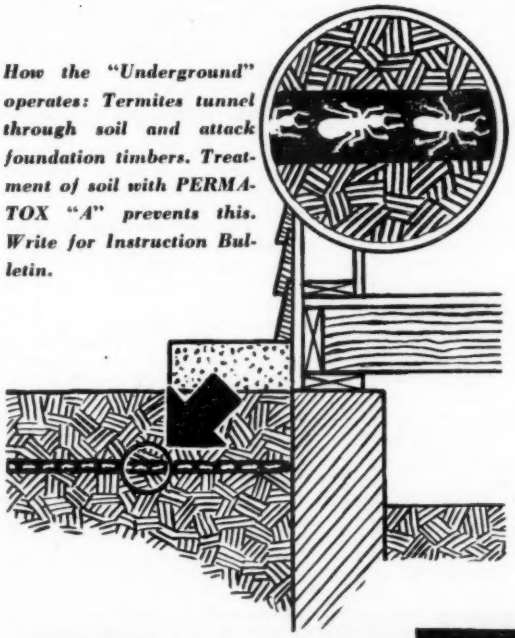

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Intimate Blending of
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By THOS. B. DORRIS, Ph.D., *Sprout Waldron Co.*

(Reprinted from Soap and Sanitary Chemicals, November, 1944.)

THE PRODUCTION of high quality insecticides has its patriotic as well as its competitive aspects at the present time. While the 1944 supply of active ingredients is probably no less than was available in 1943 (1), it must be borne in mind that the latter left much to be desired. It has been estimated (2) that agricultural losses in the United States due to insect damage in 1943 were over a billion dollars. The same period produced records (3) of such staggering losses as 900,000 tons of cotton seed oil and more than a million bales of cotton. One tangible contribution to the remedy of this situation is the production of better insecticide dust blends.

Insecticide dusts are composed of one or more active ingredients which may be solids or liquids, dispersed in some inert carrier such as clay, bentonite, or talc. For many agents ten per cent is sufficient; more potent ingredients or synergistic combinations may run much lower. Such a combination is pyrethrum with sodium fluoride (or with sulfur). Very low concentrations of one of these ingredients are ineffective, but with both present in this same concentration, an abnormally high toxic result is produced (4).

Most of these dusts are finer than 200 mesh, and recent experimental evidence (5) leads to the conclusion that much finer dusts, well beyond 300 mesh (44 microns), have greatly improved action. In fact, current emphasis is being placed on particles well under 10 microns (6). A single row of 2500 such particles would be less than one inch in length.

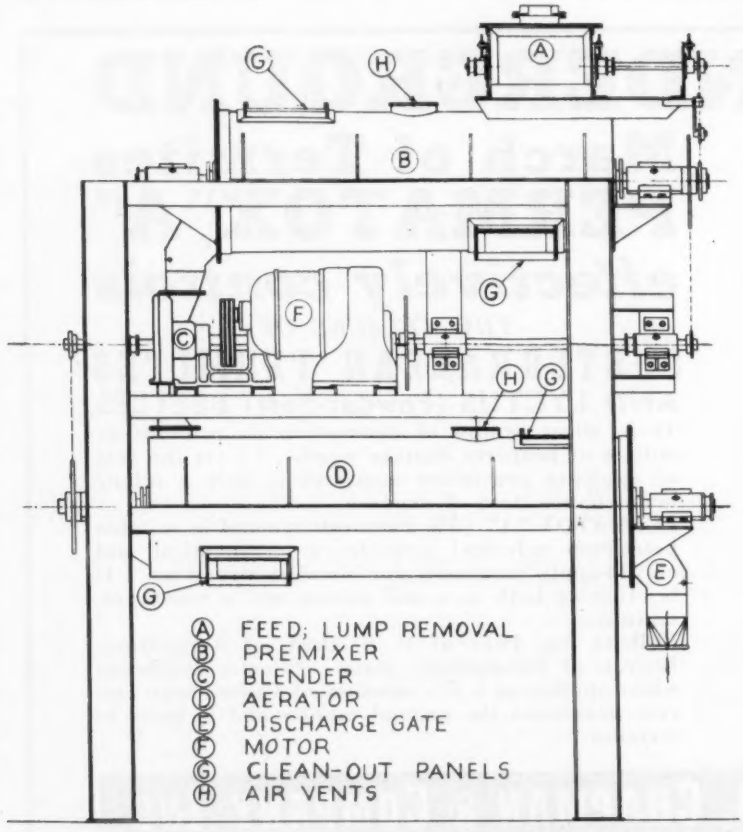

Figure 1. Intimate Blending Assembly. Feed Hopper and Dust Collecting System Not Shown.

The weight of applied toxin may be as little as one millionth of an ounce per square inch of leaf surface (2). A single dust particle of this weight would pass a 40 mesh screen, and perhaps a 100 mesh screen, depending on the identity (and therefore, the density) of the insecticidal agent chosen. A conservative estimate of the number of such particles in a single streak in any of the mixed (but unblended) samples shown in Figure III would be a minimum of 40 and a maximum of well beyond 250. With the ingredient ground to 325 mesh the corresponding number of particles per streak would be more than 12,000. In terms of distribution one small clump one millimeter (0.04") on edge, deposited on a plant surface might well represent a sufficient number of individual 325 mesh particles to cover 38 to 261 square inches with a theoretical 319 to 46 particles (i.e., one-millionth ounce) per square inch. This illustration embraces particles (or droplets) nearly as light as water and as heavy as lead arsenate.

Actually the worst extreme is probably never encountered in the field if for no other reason than a certain amount of disintegration of small clumps which occurs as the dusts are blown through the spray nozzle. The illustration serves, nevertheless, to drive home the tremendous potentialities of intimate blending which is capable of transforming ordinary insecticide mixtures into products of streak-free uniformity.

In the past six years this organization has studied the intimate blending of a wide variety of industrial powders. Frequently the uniformity requirements were even more exacting than those encountered in producing insecticide dusts. It was first proposed to define blending as the dispersing of one powder (or in some cases, a sprayed liquid) in another with a degree of uniformity beyond that which is obtainable by ordinary batch mixing. This concept generally rules out the applicability of the term where any component is larger than 100 mesh, and certainly where 50 mesh sizes are involved. Where such coarse particles are present, they are usually distinguishable under spatula tests unless some size reduction accompanies the blending operation. There followed a critical consideration of existent facilities by which such blending might be achieved.

Most of these methods are well known. Excellent results may be obtained with ball mills and rod mills. By the use of special spatulating agitators, as well as by increasing the time and speed of agitation, the results of ordinary mixing may be greatly improved. Recourse to two-batch mixing is quite common. A master batch is prepared with all ingredients present in comparable amounts. This is then mixed with the necessary proportion of diluent to give the final desired formula. A buhrstone mill can serve as a very acceptable blender while providing some additional size reduction as well. But all of these methods have found limited application, apparently because of an unhappy combination of such handicaps as insufficient uniformity, low capacity, or high operating cost. Many producers of insecticides, therefore, do not attempt to take their product beyond simple mixing.

The recognition of intimate blending as an operation distinct from conventional mixing is the basis of a practical and economical system for converting two or more powders to a fine, homogeneous product. By reference to Figure I the complete process may be easily followed. The component powders, carefully proportioned, are fed through a mechanical sifter mounted on the premixer shell. Here any accidental coarse material is eliminated and large compacted clumps of fine particles are reduced. The feed is then mixed sufficiently in the conventional manner to effect a coarse distribution. Many small undistributed clumps remain. Where mixing continued, these clumps would persist indefinitely, buried in masses of material churned about by the agitator and disturbed only if they chanced to be scraped to a very thin layer between an agitator blade and the mixer shall.

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The premix is fed, therefore, to a rotary disc blender, the working surfaces of which are illustrated in Figure II. One disc is stationary; the other attains a peripheral speed of nearly 90 miles an hour. In operation, the plates face one another and are adjusted to close setting, permitting the degree of action needed without any waste of power. Since all of the premix passes between these discs from the center to the periphery in a very thin layer, positive blending of each small undistributed clump with its surroundings is assured. For most powders the violent intimate churning effect of the plates shown is sufficient. Where clumps which do not disintegrate readily or particles too coarse for good blending are encountered, the blender must be equipped with a different type of plate. By such a change a severe rubbing action under pressure (spatulating) may be combined with precision mixing.

In actual operation it is not feasible to package insecticide dusts at the high rate at which they emerge from the blender, and experience has shown that such fine blends tend to compact markedly upon setting. Settling rates as high as 13 per cent in the first minute (without vibration) have been measured, leaving the material sufficiently rigid to maintain a vertical wall when freshly cut. Flowing qualities are correspondingly reduced.

This problem is solved by the inclusion of an aerator directly connected to the blender which serves to lower the density of the blend to give a free-flowing product readily packaged by manual withdrawal from the dust-tight discharge gate. This unit also serves as a reservoir, giving flexibility to the system and permitting continuous packaging while each on-coming batch is being processed. The aerator is similar to the premixer in operation except that it is usually desirable to provide a larger shell and a more suitable rate of agitation.

The density changes which occur are noteworthy. A feed averaging 50 pounds per cubic foot entering the premixer is expanded considerably and will probably enter the blender at about 35 pounds. The emergent blend will be somewhat heavier (37 lbs.) at the outset, the density increasing as it settles. The aerator counteracts this tendency, however, and the final free-flowing product will range between 32 and 36 pounds per cubic foot, depending on a number of conditions, some of which may be more closely controlled where warranted.

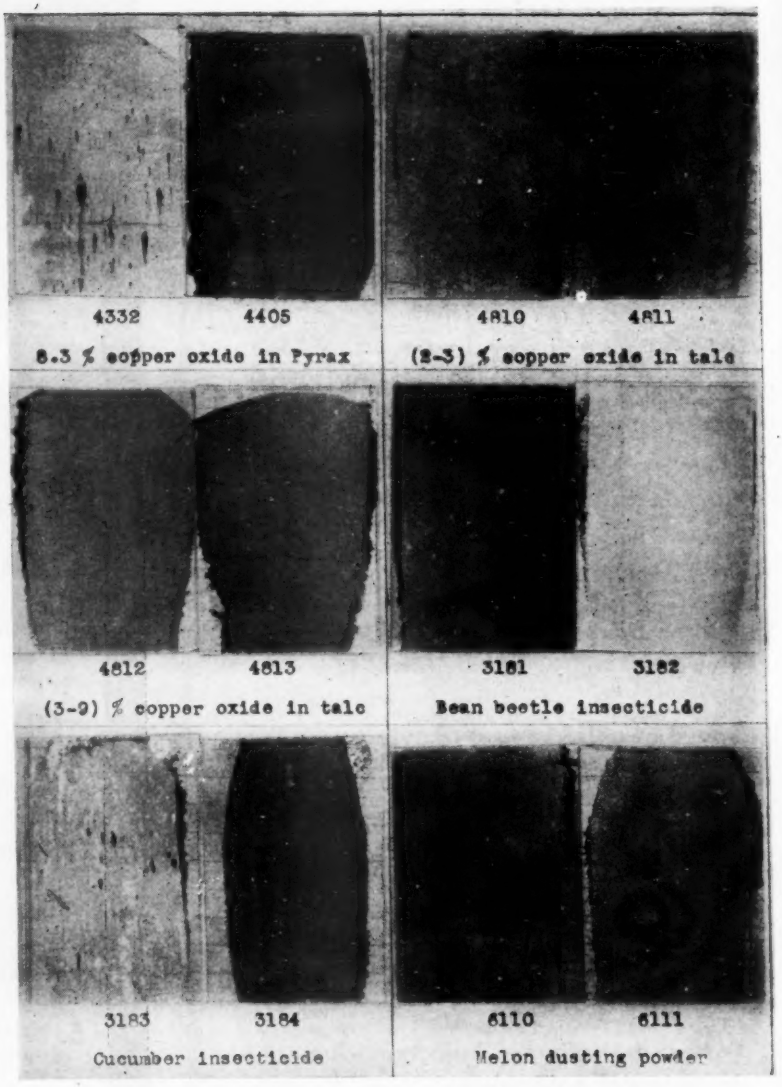

Figure 3. Effect of Blender on Mixed Insecticide Powders.

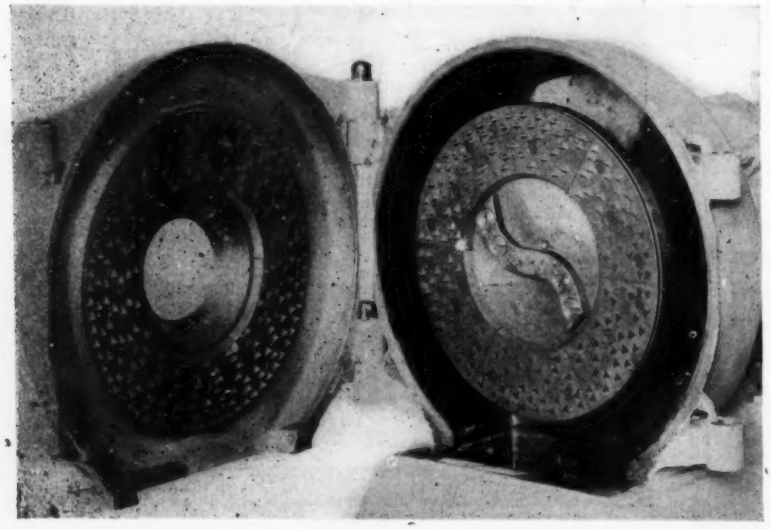

Figure 2. Blending Discs Shell Open for Cleaning.

The effectiveness of this procedure on 200 to 300 mesh insecticides is illustrated in Figure III, selected from our experimental files, and has been verified by similar results (7) obtained in full scale production. The comparison between corresponding premix and blend was made by drawing out small mounds of each under a firmly pressed spatula blade. The size of the streaks and spots characterizing the ordinary mixes may be judged by reference to the lines in the background which were actually one centimeter (about ⅜") apart. With the exception of sample 3184 (insufficient premixing) and one isolated blemish on 6111, all blends are streak-free and virtually unspotted. The long line in 3182 is a furrow; the white spots on 4811 are the background showing through bare spots in the thin spatulated layer.

Blue and white components were present in the streaks of 3181, suggesting the presence of copper sulfate and lime; the yellow material distinguishable in 3183 may have been sulfur. More significant than the identity of the undispersed ingredients were the marked changes of shade which accompanied blending—graphic evidence of the thorough dispersal of the colored patches and streaks of the premix to give a blend of outstanding uniformity. In the case of 3181, undistributed white spots resulted in the distinctly lighter pink tone of 3182. The pale pink pre-

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mix, 4332, was transformed into a deep rose blend (4405) which proved 100 per cent more efficient in field tests.

This particular pair, composed of copper oxide diluted with Pyrax ABB, were compared in a sixty day test. A treatment of 40 pounds per acre was periodically applied to tomato plants for protection against the defoliating disease, Alternaria Solani. At the conclusion of the field experiment, 16 per cent of the foliage was found intact where the ordinary mixture was applied, while the blend gave comparable protection to 33 per cent of the foliage (8).

Reference has been made to the spatula test. This is the most simple test of uniformity, but it is by no means the only test. Small samples may be selected at random and analyzed for variation in percentage of the constituent present in small amounts. Changes in shade are indicative. For fine insecticides, tunnel tests have been devised. The dust is sprayed over a length of tunnel, and the changes of composition and density noted at several successive stations. Where uniformity only is concerned, this method would seem to have certain limitations, since it measures variations in particle size and variations in the density of different ingredients as well as uniformity. Furthermore, the blending effect of the spray nozzle is a complicating factor. The use of actual field tests is also essential in evaluating insecticide dusts, but the interpretation of results must be left to expert hands.

In comparing methods of blending, none of the foregoing is sufficient for practical purposes in itself. This is especially true where only small differences in product or performance are reported. The two prime factors, economy and capacity, must also be weighed. In fact, where commercial tonnages are involved, they are undoubtedly the most important considerations.

Some idea of these performance factors as related to the process described merits attention. A complete unit designed for 500 pound batches at the rate of three or more per hour can be mounted in a single frame to permit gravity flow through the system from the feed inlet 12 feet high to the discharge gate placed 30" above the floor to facilitate packaging. This unit requires a floor area 4' x 10' only. It is driven by a single 15 H.P. motor, so that power costs as low as 15c to 30c per ton are readily attained. Larger installations are best installed on two floor levels, necessitating the use of automatic conveyors and elevators between units. In spite of this, the same low power costs obtain.

This concludes the essential description of apparatus and procedure, but in actual installation and operation many related problems still remain. One of the most pressing is provision for dust-free operation, a major personnel hazard in the production of dust insecticides. Fine particles, especially those under 10 microns, have a marked tendency to become and remain suspended in the atmosphere. In fact this characteristic is the basis of the production of aerosol (9) fogs and mists, one of the newer techniques in the application of dusts. Careful construction of equipment to give dust-tight flow, and proper arrangement of air vents are essential, but offer no relief to employees engaged in proportioned feeding and packaging. The need for proper ventilation cannot be emphasized too strongly, especially at the packaging end, for which a separate hood and fan should be provided.

The changing nature of ingredients as new developments come to the fore must also be considered. The current shortages of rotenone and pyrethrum have focused attention on some of the synthetic liquid insecticide concentrates. If these are to be incorporated into dusts, they should be applied in the premixer by utilizing a fine spray arrangement. Some small clumps will be produced, but these are eliminated in the blender to give a very even distribution of the liquid absorbed on its dry dust carrier. At present DDT is best known as an essential ingredient of louse powder, but its great versatility makes it certain to become an important factor in the composition of post-war dust insecticide formulas for many other purposes. With its incorporation will come new problems peculiar to the mechanical milling of low melting solids, for it is a soft waxy material in its pure state.

Reference could be made to a number of other conditions or problems involving operational variations from the basic procedure outlined in this article. Having already encountered many such conditions in meeting individual production technics, there is every reason to believe that the process as described in essential detail herein can be adapted to all fine blends likely to be required by producers of dust insecticides.

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2. Chemurgic Digest, 3, 103-4, 109-10 (1944).
3. Soap and Sanitary Chemicals, 20, 125 (January 1944).
4. Ibid, 20, 121 (January 1944).
5. Industrial and Engineering Chemistry, 34, 490 (1942).
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7. Pennsylvania Co-op Review, 8, (April 1944); also, 24 (October 1944); Farm Bureau, Harrisburg, Pa.
8. Private communication, Connecticut State Agricultural Experimental Station, New Haven, Connecticut (1941).
9. Soap and Sanitary Chemicals, 16, 121 (June 1940).

Additional Patents Relating to Pest Control

By **DR. R. C. ROARK.**

2,362,128 (Nov. 7, 1944; appl. July 28, 1942). INSECTICIDE. Samuel I. Gertler and Herbert L. J. Haller, Washington, D. C. – Secretary of Agriculture.—The pattentees claim a method of destroying insects comprising contacting the insects with an insecticide in which an essential active ingredient is N,N-diethyl-piperonylamide. The composition may also contain pyrethrum.

2,362,351 (Nov. 7, 1944; original appl. Jan. 30, 1941. Divided and this appl. Sept. 27, 1943. INSECTICIDE DISPENSER. Frederick H. Burmeister and Ira F. Flatz, Toledo, Ohio—Air-Way Electric Appliance Corp., Toledo, Ohio—A vacuum cleaner attachment for applying a crystalline volatilizable insecticide substance is described.

2,362,385 (Nov. 7, 1944; appl. Nov. 13, 1942). GERMICIDAL LAMP. Jules L. Libby, Elgin, Ill.

2,362,471 (Nov. 14, 1944; appl. Dec. 16, 1941). PARASITICIDE. Robert R. Dreisbach and Fred W. Fletcher, Midland, Mich.—The Dow Chemical Co., Midland, Mich.—An insecticidal composition comprises as an active toxicant an alkyl-substituted mononitro-naphthalene and a carrier therefor.

2,362,472 (Nov. 14, 1944; appl. June 1, 1942). FUMIGANT MIXTURES. Robert R. Dreisbach and Fred W. Fletcher, Midland, Mich.—The Dow Chemical Co., Midland, Mich.—A fumigant composition comprises from 5 to 95 percent by weight of methyl bromide in mixture with monomeric methyl isopropenyl ketone.

2,362,475 (Nov. 14, 1944; appl. June 1, 1942). FUMIGANT. Fred W. Fletcher and Robert R. Dreisbach, Midland, Mich.—The Dow Chemical Co., Midland, Mich.—A fumigant composition comprises a mixture of monomeric methyl isopropenyl ketone and chloropicrin.

2,362,614 (Nov. 14, 1944; appl. March 11, 1940). INSECTICIDES. Jose B. Calva, St. Paul, Minn.—A mothproofing substance comprises a mixture of mono-, di-, and tri-ethanolammonium fluoride.

2,362,760 (Nov. 14, 1944; appl. Jan. 12, 1943). INSECTICIDAL COMPOSITIONS. Kenneth E. Maxwell, Martinez, Calif.—Shell Development Co., San Francisco, Calif.—A method of increasing the deposition of suspended insecticidal toxicants (e. g. lead arsenate, cryolite) from an aqueous carrier comprises adding thereto a small amount of the salt of a polycarboxylic acid of less than 7 carbon atoms with anacylated alkanol N-alkylenepolyamine, in which the acyl radical has a terminal hydrocarbon chain of at least 8 carbon atoms.

2,362,768 (Nov. 14, 1944; orig. appl. Aug. 3, 1940; devided and this application Nov. 26, 1942). MOTH REPELLING PRODUCT. Willard L. Morgan, Columbus, Ohio, and Earle Davis McLeod, Rumford, R. I.—Arnold, Hoffman & Co., Inc.—These products are substituted ureas, thioureas, guanidines, biurets, guanyl ureas, or diguanidines of high molecular weight in which each of the terminal carbamyl nitrogens has been substituted through linkage with a polyamino acid amide.

2,362,946 (Nov. 14, 1944; appl. July 31, 1940). SPRAY GUN. Harry C. Stockdale, Ravenna, Ohio—Food Machinery Corp., San Jose, Calif.

2,363,148 (Nov. 21, 1944; appl. Apr. 13, 1942). DISPENSING CONTAINER. Samuel S. Rosen, New York, N. Y.—A bellows container is described.

2,363,240 (Nov. 21, 1944; appl. Dec. 21, 1942). METHOD OF REFORMING MATERIALS AND PRODUCT THEREOF. Jacquelin E. Harvey, Jr., Washington, D. C., and Robert H. White, Jr., and Joseph A. Vaughan, Atlanta, Ga.—One-half to said Harvey, Jr., and one-half to Southern Wood Preserving Co., East Point, Ga.—This invention relates to the production of toxic oils employable as fungicides and insecticides from mixtures of petroleum fractions characterized by ring structure content.

2,363,241 (Nov. 21, 1944; appl. Dec. 21, 1942). USEFUL PRODUCTS AND PROCESS OF PRODUCING THEM. Jacquelin E. Harvey, Jr., Washington, D. C., and Robert H. White, Jr., and Joseph A. Vaughan, Atlanta, Ga.—one-half to said Harvey, Jr., and one-half to Southern Wood Preserving Co., East Point, Ga.

2,363,561 (Nov. 28, 1944; appl. June 15, 1940). CYCLOHEXYLAMINE SALTS. Frank B. Smith and John N. Hansen, Midland, Mich.—The Dow Chemical Co., Midland, Mich.—The dicyclohexylamine salts of tri-, tetra- and pentachlorophenol are insecticidal against Mexican bean beetle, Colorado potato beetle and black carpet beetle.

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TERRATOX is good. It is as good as we can make it . . . and we don't take our hat off to any organization on experience, knowledge and facilities in manufacturing Termite Control and wood treating chemicals.

TERRATOX No. 215 is a water solution. TERRATOX No. 225 is an oil solution. Both are concentrates for economy in use. TERRATOX is used for both wood and soil treatment.

NEW

Quick Kill TERRATOX No. 245

This new TERRATOX is for use where a chemical of extra fast working results is wanted.

Send for Price List and complete Specification Sheet. TERRATOX is the right hand helper of the operator who wants to do a thorough termite control job.

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TERRA TOX

WOOD TREATING CHEMICALS CO.

TERMITE CONTROL

5137 Southwest Ave. St. Louis 10, Mo.

Snapshots Taken at The 5th Eastern PCO Conference

Photographs that appear below will undoubtedly demonstrate what interested PCO's can accomplish once they make up their minds to do some research work of their own. Specifically, we call attention to the Fumigation Chamber engineered, constructed, and demonstrated by Fred Bowers as shown in picture 2. The Dusting Tower and experiments with roach powders is a product of the New Jersey Pest Control Association with the major work being done by J. Edwin Sameth, ably assisted by several of the membership of the New Jersey Pest Control Association.

Camera courtesy of John Medoff

1. Dr. Sweetman and Ed Sameth at the conclusion of the demonstration of tests run with the Insecticidal Powder Testing Tower. This entire apparatus was engineered and constructed by Ed Sameth, the mechanics of which represent the best features of similar apparatus used in various testing laboratories. While Ed disclaims any credit for originality of the entire apparatus, admiration must be expressed for his good taste in "borrowing" the best ideas of each apparatus and combining them into one. The celluloid column is six feet high and twelve inches in diameter and because of its height and fragile nature, Ed was unable to bring this component part to Amherst. Through the good offices of Dr. Sweetman a column was made at Amherst to fit the base for the entire apparatus. By the use of telephone, letters, diagrams, pictures, and mental telepathy, Ed Sameth described to Dr. Sweetman the type of celluloid column to make for him, with the result that the component parts fitted well and worked perfectly.

(Continued on page 24)

Pointer for Manufacturers of Technical Products

DEODOR-SCENTS are a copyrighted MM&R exclusive . . . *exclusively* formulated to cover the odors of ingredients used in fly sprays and other technical products.

With MM&R Deodor-Scents, every trace of undesirable odor is removed positively and permanently, and at a cost so low you'll marvel at their extraordinary efficiency.

To meet varied needs, MM&R Deodor-Scents are made in two types—

Type A—*To Neutralize and Perfume*
Type B—*To Neutralize Without Perfuming*

If possible, send us your unperfumed product, and we will return "Deodor-Scented" samples. Deodor-Scents for testing on request.

It's not a Deodor-Scent if it's not labeled MM&R

Magnus Means Reliability

MAGNUS, MABEE & REYNARD, INC.

SINCE 1895 ONE OF THE WORLD'S GREATEST SUPPLIERS OF ESSENTIAL OILS

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USE **PRENTISS' FORTIFIED RED SQUILL** FOR **RODENT CONTROL**

STANDARDIZED ACTIVATED FORTIFIED EFFECTIVE

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A remarkably stirring inspirational educational film; 106 scenes, 52 titles, 800 ft., 16 mm black 7 white silent, requiring 30 minutes to show.

The cast-in destructive action; moths, buffalo and black carpet beetles, powder post beetles, cockroaches, bedbugs, fleas, termites, ants, bats, rats, mice, etc.

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Gain prestige and appreciation — build steady profitable business by showing film to Health, Food, and Sanitary Inspectors, men's service and women's clubs, associations and organizations, real estate boards, hotels, restaurants, groceries, groups in small towns, etc. $110.

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AMERICAN FLUORIDE CORPORATION

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2. Fred Bowers and his fumigation chamber. Among the features of this chamber was the mechanical means of venting the gas out of the building by the use of an electric exhaust system connected to a long rubber tube.

3. Father O. Fournier.

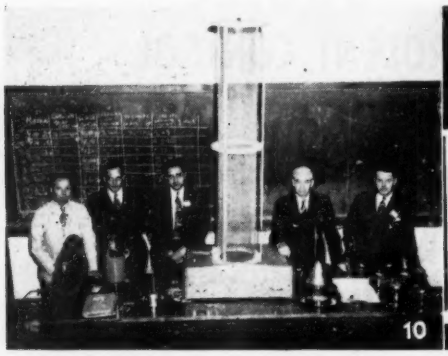
4. Charles Pomerantz telling of pitfalls of a tick job. The exhibit in the background is only part of the demonstrating material that Charlie brought along to enable him to impress the conference with the necessity of doing a thorough job.

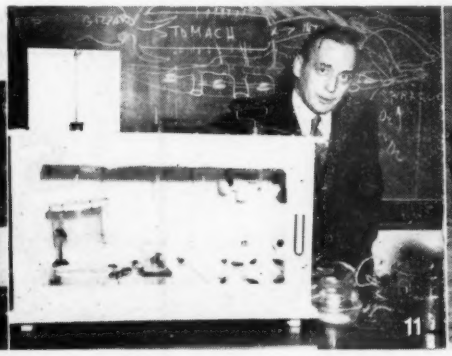
5. The Spark Plugs of the Association, Bill Buettner and Ted Oser. Bill can stand the glare of the New England sun but Ted, who comes from the South, is having a little difficulty with the bright sunshine on the bright snow.

6. Ernest M. Mills. His happy expression no doubt comes from the satisfaction that he has just imparted to the conference some useful and pertinent information.

7. Dr. Alexander and Bill Buettner showing that not only can they talk well but they also make attentive listeners.

8. C. A. Vincent-Daviss reviewing with the PCO's some important chemical terms.





Camera through the courtesy of Phil Mayer.

10—Dusting tower demonstration was well received at the Eastern PCO Conference at Massachusetts State College. Left to right J. Edwin Sameth, Newark, N. J.; Fred Bowers, Rahway, N. J.; John Medoff, West New York, N. J.; Dr. Harvey W. Sweetman, Department of Entomology, Massachusetts State College, Amherst, Mass., and David McAlindin, Hoboken, N. J.

11—Fumigation chamber constructed by Fred Bowers of Rahway, N. J., and demonstration of action of cyanide on American roaches.

12—The "low-down" on dog ticks by Charles Pomerantz, Bell Exterminating Co., New York, N. Y.

An Ancient Racket

"The authorities of Lincolnshire, England, have had to learn the hard way. It seems that in an anti-rat crusade 90,000 rat tails were turned in for the bounty, which required an expenditure of about $2,200. But as wiser heads might have told them earlier, the bounty system makes for abuses. Some of the racketeers, seeking the bonus, bred rats by the thousands in special cages. The bounty has been withdrawn. The rat breeders resorted to one of the oldest of all racketeering devices. Only a year or so ago, in one of our own Western states, trouble arose when it was discovered that greedy cowhands were raising coyotes just to get the bounty. The trouble, in one form or another, doubtless existed in the days of the Pharaohs, and before. A sure way to bring out the inherent cussedness of the human race is to offer a reward, or a bounty, or a bonus for something—almost anything."

—From the Editorial Section of the N. Y. Herald-Tribune.

Flour Beetle More Prolific in Enriched Flour

Commercially stored stocks of enriched baker's flour are no more likely to be attacked by the flour beetle than unenriched flour in storage, but spoilage losses from this pest may be greater, the U. S. Department of Agriculture reports following investigations by Department entomologists in cooperation with the Kansas Agricultural Experiment Station. Previous to these experiments, instances of spoiling of enriched flour stock seemed to indicate that stored enriched flour might be more attractive to flour pests.

In these experiments it was found that enriched flour is no more attractive to flour beetles than non-enriched flour, and that beetle larvae do not grow any faster in enriched flour. However, the flour beetle produces many more beetles when feeding in enriched baker's flour than on a diet of non-enriched flour, thus providing more pests to spoil the enriched flour once it has become infested.

This increase in reproduction, say the scientists, is caused by the addition of riboflavin (vitamin B_2). Riboflavin, when added in amounts required by the Federal Standard of Enrichment was found to increase the rate of beetle reproduction by over 70 percent. Vitamins in the B-group are required for growth by insects as well as man, say entomologists. Vitamins added to flour for enrichment, make it a more nourishing diet for flour beetles. Special precautions need to be taken during storage to detect the presence of flour insects and to use up enriched flour promptly or to fumigate, sift, or treat it with a centrifugal machine as soon as infestation is detected.

Federal Trade Commission Stipulation in the Matter of Alvox Laboratories

"Joseph Schatzberg, a sole trader operating as Alvox Laboratories and also as Aborn Exterminating Company, with place of business at Newark, N. J., engaged in the sale and distribution of an insect powder under the trade brand or designation "Alvox Roach Powder" in interstate commerce, . . . agreed that he will forthwith cease and desist from:

(a) Representing that Alvox Roach Powder or any other product is manufactured by him, or otherwise, by statement or inference, that he owns and operates or directly and absolutely controls the plant or factory wherein such powder is made; and from the use of the word "Laboratories" as part of his trade designation or in any way so as to import or imply that he maintains a laboratory, that is to say, a place devoted to experimental study or for the compounding or manufacture of such powder or any other chemical product;

(b) Representing, directly or inferentially, that Alvox Roach Powder or any preparation of like composition has higher Peet Grady Rating than other exterminating powders, is superior to sodium fluoride, is odorless, kills roaches stone dead on their backs in 10 minutes or less, is one of the most important discoveries—or a new discovery at all—to exterminators in the past 25 years, or that under conditions of use it retains chemical stability at all times or will not deteriorate; or that hundreds of professional exterminators, or any number of persons exceeding the true total thereof, are using Alvox Roach Powder with miraculous or extraordinary success . . . "

—Released, December 28, 1944.

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TERMITE HOSE!

AMERICA'S FINEST FOR 16 YEARS

Guaranteed to Outwear and Outlast any Other Hose or Money Refunded

WHY BUY DATA

★ A 16-Year Proven Product
★ Built for the Job Exclusively
★ GUARANTEED with 43 Years Behind It

Write Today for Price and — FREE SAMPLE

Also Rock Wool Hose and Cyanide Hose

"The Rubber House of the Americas"

BROADWAY RUBBER MFG. CO.
529 East Broadway Dept."P" Louisville, Ky.

Dead Rat

and Other Odors Can Now be Effectively Eliminated by the Use of

X-ODOR-O

THE ODORLESS DEODORANT

Acclaimed by Pest Control Operators from Coast to Coast as a Wonderful New Development in handling ODOR problems.

SAFE - ECONOMICAL

Prices and full information on request.

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Easy TO USE

KILLS ANTS

CONTAINS THALLIUM SULPHATE

Packed in convenient sizes
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10 lb. jars
100 lb. drums

Used professionally it assures customer satisfaction.

Sold over the counter it means added profits.
Preferred by discriminating PCOs.

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No obligation.

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BOSTON · PHILADELPHIA · CHICAGO · ST. LOUIS · LOS ANGELES
Plant and Laboratories: Bayonne, N. J.

SELECTING ODORS

By **F. AUMUELLER**
The Cramer-Krasselt Company

ODORS and flavors exert profound influences on people, yet throughout history they have baffled all attempts of science to classify them. Sight and hearing depend upon the wave motions of light and sound and these can be measured, classified and exactly defined. The sense of touch, too, depends on the vibrations characteristic of heat, which also yield to scientific measurement and definition. Yet despite the great power of scents and tastes to affect and control human psychological reactions, no corresponding scientific basis has yet been discovered to systematize them.

Chemical reactions produced when infinitesimally minute amounts of odorous or flavorful substances reach the sensitive surfaces of the nose, tongue and throat are apparently responsible for the sensations of smelling and tasting. These reactions necessarily range over the immense variety of chemically different substances causing them and thus elude exact classification. In a remarkable way, the taste buds of the tongue and the sensitive surfaces of the nose, palate and throat supplement each other so that no rigid distinction exists between smell and taste. With few exceptions, the two supplement and reinforce each other to give a sensation so combined that its parts are indistinguishable.

Even though the subject remains in the realm of art rather than of exact science, the psychological effects of odors and flavors have been potent factors in all human behavior. The desire for pleasant odors exerted profound effects at many points in the world's history. The explorations of Columbus, Vasco da Gama and the great company of discoverers of the Renaissance were undertaken to find safer, shorter routes to the spices of the East. Today in countless ways odors and flavors influence trade and the lives of people.

Lacking a more exact method of classification, one must seek the key to odors' effects by trying them on many people. To simplify this task of gathering information, odors can be grouped into categories based on rough similarities. Thus in making a recent survey of the responses of several hundred people to odors, we classified them into these six groups: Flowery, Fruity, Spicy, Resinous, Burnt and Putrid.

While this grouping leaves much to be desired from a scientific point of view, it served the present purpose. Its short-comings are apparent since it takes no account of the complexity of most odors, obvious differences in power and pungency, and other less apparent characteristics of odorous substances.

The results of the survey are interesting. In the following tabulation personal reactions to the selected odors are noted in each case as percentages in three categories—like, neutral and dislike—with a minor percentage in each case who did not reply.

The table of results suggests the general reactions of people to odors and is based on a sufficient number of tests to be usable in many applications of odors to commercial problems.

A breakdown of the results showed that women generally show a higher preference for flowery, fruity and spicy odors than men and that men have a slightly greater preference than women for resinous and burnt odors.

A further reclassification of preferences by age groups gave further interesting suggestions. Jasmine and heliotrope, which are rather old-fashioned flowers, have a decided preference among older persons. On the other hand, chocolate is best liked by the youngest age group. Onion and garlic odors are liked best in the oldest group. Interesting to note is a falling off in the preference for the gasoline odor as persons grow older. Evidently the youngest generation, raised with the automobile, has learned to associate the odor of gasoline with good times, hence nearly one out of every four likes it.

Flowery	Like %	Neutral %	Dislike %	No Reply %
Rose	85	13	2	0
Violet	77	17	5	1
Jasmine	38	43	13	6
Heliotrope	43	36	16	5
Lavender	55	29	12	4
Lilac	83	12	4	1
Carnation	65	19	13	3
Lily of the Valley	77	17	4	2
Honey	38	48	11	3

Spicy	Like %	Neutral %	Dislike %	No Reply %
Cinnamon	56	33	10	1
Clove	47	30	22	1
Nutmeg	35	36	27	2
Sage	24	42	31	3
Caraway	30	40	28	2
Chocolate	66	27	6	1
Tea	37	44	18	1
Vanilla	62	28	8	2
Wintergreen	67	22	9	2
Peppermint	63	25	11	1
Sarsaparilla	22	50	23	5

Burnt	Like %	Neutral %	Dislike %	No Reply %
Coffee	76	16	7	1
Maple	48	33	18	1
Tobacco	35	28	36	1
Tar	26	21	52	1
Smoked Meats	25	34	40	1

Resinous	Like %	Neutral %	Dislike %	No Reply %
Camphor	38	28	34	0
Cedar	73	17	9	1
Balsam	76	15	7	2
Pine	83	13	2	2
Witch Hazel	39	47	12	2
Menthol	43	37	19	1
Turpentine	11	24	63	2

Fruity	Like %	Neutral %	Dislike %	No Reply %
Orange	63	29	7	1
Lemon	52	34	13	1
Pineapple	60	31	8	1
Peach	52	41	6	1
Grape	47	36	16	1
Canteloupe	49	34	15	2
Apple	67	27	4	2
Olive Oil	6	23	70	1
Vinegar	11	33	54	2
Cider	33	38	28	1
Strawberry	68	26	5	1
Raspberry	63	31	5	1

Putrid	Like %	Neutral %	Dislike %	No Reply %
Rubber	4	13	81	2
Onion	13	21	66	0
Garlic	1	6	92	1
Sauerkraut	21	25	53	1
Fish	10	19	70	1
Lard	2	18	79	1
Kerosene	7	15	77	1
Gasoline	17	23	59	1
Perspiration	0	1	97	2

—*"The Frontier," Armour Research Foundation.*

EFFECTIVE FUMIGATING WITH ACME GAS MASKS

The Acme No. 4 FULL VISION Gas Mask has been firmly established as a definite safety aid in effective fumigating operations. This Mask provides the fumigator with Non-Distorted FULL VISION to all sides, thereby enabling him to speed up his work with a greater degree of efficiency and safety. The FULL VISION Lenses are made of Wide, Flat Safety Glass that DO NOT distort the vision.

The facepiece is made of high quality live rubber assuring ease in wearing, and long life. There are no rivets, threads or taped pads to irritate the wearer's face or head, or cause headache discomforts.

The Acme Canister protects against any fumigating gas, or combinations of gases. Write for literature and prices on your requirements.

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Manufacturers of Respiratory Protective Devices
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Introducing

A NEW
Organic Insecticide for Crawling Insects

NH INSECT DUST

A NITRATED HYDROCARBON DERIVATIVE

1. Has quick action and "drive out."
2. Kills insect eggs in addition to acting like a Pyrethrum-Sodium Fluoride combination.
3. Gives high kill and long residual action.
4. Costs less than Pyrethrum powder.
5. Eliminates the hazard of using highly poisonous powders.
6. Ideal for packagers of "Roach Powders" or for service work against roaches, bed bugs, ants, silverfish.
7. Offered to you only after our customary careful laboratory and field studies, including months of practical trial by numerous Pest Control Operators.

PYRISCENTS—If you have a perfuming problem, investigate these specially compounded insecticide perfumes. Pyriscents are available in many odors and are completely oil soluble.

"ASK US FOR A SAMPLE"

JOHN POWELL & CO.
One Park Avenue
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EXTERMINATORS CHEMICALS

RUMETAN
ZINC PHOSPHIDE
FOR RAT CONTROL

With thallium sulphate difficult to obtain, try RUMETAN . . . the ideal poison for Rats, Mice and Mole Crickets. Effective and economical. Write for details.

Pfaltz & Bauer, Inc.
EMPIRE STATE BUILDING, NEW YORK

PHOSPHOROUS PASTE

FOR ROACHES and RATS

SINCE 1874

J-O Phosphorous Paste is so compounded as to eliminate the hazard of fire and possesses advantageous qualities peculiar to itself. A properly made **Phosphorous Paste** such as **J-O** is absolutely safe to use. It cannot burn or set fire to other substances.

Phosphorous, however, remains basic in the compound because it is the most toxic chemical used in pest exterminating, being more toxic than arsenic, strychnine or thalium. Approximately one-tenth of a grain will kill a rat. Phosphorous is a slow poison, taking from 6 to 18 hours to kill. Due to its slow but positive action, the rat succumbs to this poison. He becomes very uncomfortable and, seeking fresh air and water, in most cases, leaves the premises and dies in the open.

For all species of roaches, this product is **UNEXCELLED.**

JOHN OPITZ, INC.
50-14 39th Street Long Island City 4, N. Y.
Manufacturers of Exterminating Products Since 1874

WHAT'S NEW IN PEST CONTROL-PERSONALS

DR. GUY F. MacLEOD

Dr. Guy F. MacLeod, an honorary member of the NPCA, is the new chief of the Chemicals and Fertilizers Branch of War Food Administration. Born 47 years ago in Lowell, Mass., he studied at Massachusetts State College, served in Naval aviation in the first World War, and returned to graduate in 1920.

After field research studies of insect and disease control problems of deciduous fruits and truck crops at the Geneva (N. Y.) Experiment Station, and graduate study at Cornell University, Dr. MacLeod in 1924 became extension entomologist at Pennsylvania State College.

More graduate work at Cornell led to a professorship in entomology there in 1930, followed by eight years of teaching and direction of research. In 1938 he went to California for a sabbatic year and stayed to direct research work in agricultural entomology, dividing his time between this, graduate and undergraduate teaching, and helping to revise the curriculum in entomology and parasitology.

On a war leave of absence he joined the War Food Administration in November, 1943, as chief of the Chemicals Division. His new post adds the control of the fertilizers division.

Our congratulations and warmest well wishes to Doctor MacLeod.

An article about CHARLES V. SPARHAWK, of the Sparhawk Co., Sparkill, N. Y., refers to him as "The man who made perfume for rats!" Like Mark Twain's "The Man Who Corrupted Heidelburg" it had its truth mixed with fiction.

DR. C. C. McDONNELL LEAVES WFA INSECTICIDE DIVISION

Retiring from government service March 1, Dr. Curtis C. McDonnell, chief of the insecticide division of the Livestock and Meats Branch of the Office of Marketing Services of the War Food Administration, has been succeeded by Dr. W. G. Reed, who has been with the department since November, 1929. Dr. McDonnell has served with the Department of Agriculture since his appointment as assistant chemist in the Bureau of Chemistry in 1907.

Vacationing in Miami during February were Mr. and Mrs. Sidney Wimmer. Sidney is with Majestic Ext. & Chem. Co., N. Y.

D. H. LEWIS JOINS DIVISION OF FISH & WILDLIFE SERVICE: Donald H. Lewis, member of the Buffalo rat-control staff since last September, announced today that he has accepted an appointment as an assistant district agent of the Predator & Rodent Control Division of the U. S. Fish and Wildlife Service, Department of the Interior. He will work out of Cornell University, beginning Monday, in collaboration with Assistant District Agent William S. Heit, supervisor of predator and rodent-control work in New York State.

(The above was copied from the Buffalo Evening News, Buffalo, N. Y.)

RAY V. BECHTEL: Congratulations are in order to Ray V. Bechtel whose company, the Aristo Pest Control Service, has moved to new quarters at 4548 Grand River Ave., Detroit 8, Michigan.

MOSQUITO TESTS IN JERSEY

Thomas D. Mulhern, secretary of the New Jersey Mosquito Extermination Association in charge of mosquito control at the State Agricultural Experiment Station, announced in March in New Brunswick, N. J., that enough DDT has been made available for extensive mosquito-control experiments in that state this summer.

AT A MEETING of pyrethrum processors in Washington last month, word got out that pyrethrum imports from Kenya over the balance of 1945 are going to be large—really big. How much of this will be allocated to agricultural and household insecticide uses, if any, is a question. More of it, however, will go into Army and Navy louse powders to speed up the present slow action of plain DDT powders.

Soap and Sanitary Chemicals.

JOHN POWELL AND CO. have moved their executive offices to larger quarters at One Park Avenue, just across the street and north of 114 East 32nd Street where they will continue to maintain their Export Dept., Technical Sales Dept., and laboratories. This move enables the Powell organization to enlarge their laboratory facilities to twice that formerly used by their chemical and biological laboratories which are being used extensively for research and development work and for Army and Navy sub-contract work that requires considerably more space. The Powell executive offices have been maintained at their old address for the past eighteen years and their larger quarters at One Park Ave. are necessary because of increased activities. The telephone numbers remain unchanged.

THE SIX MISTAKES OF MAN

"There are six mistakes of life that many of us make," said a famous writer.

1. The delusion that individual advancement is made by crushing others.
2. The tendency to worry about things that cannot be changed or corrected.
3. Insisting that a thing is impossible because we cannot accomplish it.
4. Refusing to set aside trivial preferences.
5. Neglecting development and refinement of the mind and not acquiring the habit of reading and study.
6. Attempting to compel other persons to believe and live as we do."

—From Kalends.

"Human Lice" (and their control) is the subject matter of Service Letter No. 2, a bulletin issued by Louis Gatto Company, Beaver Falls, Pa., and sent to managers of the Housing Authority of the County of Beaver.

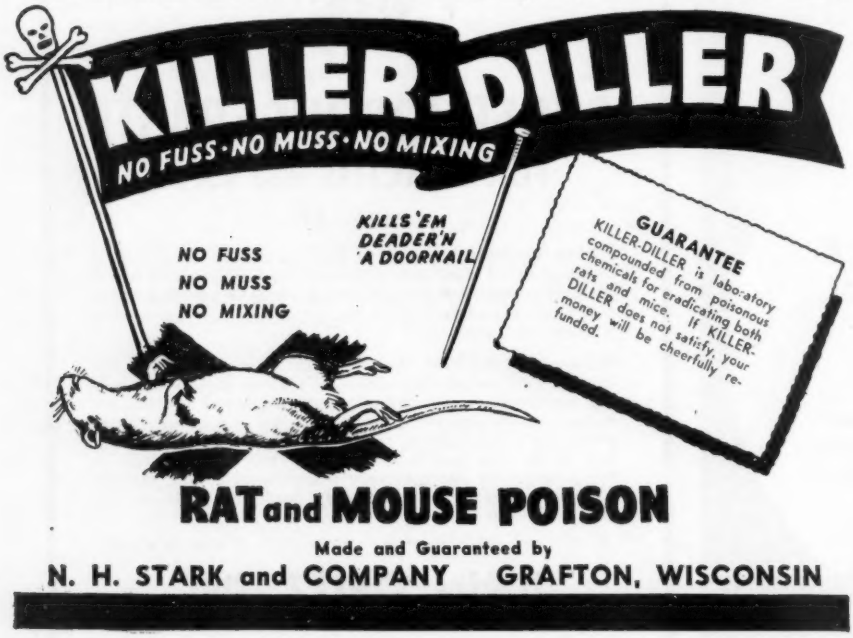
DDT.—The War Production Board recently announced that a limited quantity of DDT has been released for use in agricultural and other civilian experimentation. Though previous requests for individual allocation of DDT necessitated application to the WPB, it can now be obtained directly from the producers without further permission from the WPB.

"ANCIENT FUMIGATION. — Acron, a Greek physician, is reputed to have originated fumigation in 743 B.C. when he halted a plague in Athens by burning aromatics in grate fires."

The U. S. Patent Office has granted a Patent with eight Claims on a method of producing MUSK, from Musk-rat, Skunk, Mink, Deer and other Animal Sources to Charles V. Sparhawk, Sparhill, N. Y. The number of the patent is 2,368,578—MUSK-LIKE PREPARATION.

This is the first American patent concerned with MUSK made from Domestic Glandular Material. It is also the first Commercial article to compete with the Imported Fixative Materials, obtained from Foreign Countries, where Asiatic Musk and Abyssinian Civet were well recognized ingredients for Perfume making.

The application for the patent was filed by Charles C. Sparhawk June 13th, 1941. The two articles MUSKAT from musk-rat and PETRA from skunk had previously been advertised under those brand names in the usual Trade Journals as replacements for the former fixative ingredients. So the U. S.


KILLER-DILLER
NO FUSS · NO MUSS · NO MIXING
KILLS 'EM DEADER 'N A DOORNAIL
NO FUSS
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NO MIXING
GUARANTEE
KILLER-DILLER is laboratory compounded from poisonous chemicals for eradicating both rats and mice. If KILLER-DILLER does not satisfy, your money will be cheerfully refunded.

RAT and MOUSE POISON

Made and Guaranteed by

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NO RUSH ORDERS PLEASE
BEST DELIVERY 3 WEEKS

Due to the Labor Shortage in this Area and the Limitations Placed on Metal, we cannot render the prompt service as in the past. We regret any delay and assure you we will give the best service possible under present conditions.

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No. 1007 "Regular"

MICE-GLUE
GETS MICE LIKE FLYPAPER GETS FLIES
10 lbs. $6.00 25 lbs. $13.50 100 lbs. $45.00

BIRD-REPELLENT
Keeps Pigeons, Starlings and Other Birds from Buildings
10 lbs. $6.00 25 lbs. $13.50 100 lbs. $45.00

PHOSPHORUS-PASTE
For Rats, Mice and the Large Brown and Black Roaches
10 lbs. $4.25 25 lbs. $9.00 100 lbs. $32.50

PEST CONTROL CHEMICALS CO.
324 Broadway Write for Details BUFFALO, N. Y.

"TOX-EOL" 12½ TO 1 SUPER CONCENTRATE

NOW AVAILABLE WITHOUT PRIORITIES

FOR TERMITE CONTROL

Chlorinated Phenol Toxic Base, which has been effectively used for many years by the larger Termite Control Operators from Coast to Coast in the "TOX-EOL SYSTEM" of Termite Control.

This new super strong CONCENTRATE may be diluted with 12½ parts Fuel Oil, Kerosene, or even Crank Case drainings to make the proper strength (over 5%) treating solution.

"TOX-EOL" 12½ CONCENTRATE means lower transportation charges, fewer containers—lower chemical cost. Now costs less than creosote.

FOR WOOD OR SOIL TREATMENT

Write for our plan of dealer co-operation and 5 year Warranty.

CRE-O-TOX CHEMICAL PRODUCTS COMPANY

Pioneers in the use of Chlorinated Phenols for termite control.

MADISON AT WILLETT MEMPHIS 4, TENNESSEE

GREATER *Kills* with CERTOX
REG. U. S. PAT. OFF.

Rodent Seed, Ant Jelly, Arsenic, Carbolic, Pyrethrum, Cresylic, Red Squill, Derris Powder, and other effective chemicals that do a thorough job for the Pest Controller. The quality of CERTOX products remains unaffected by the national emergency. Prices, too, are near normal.

YOUR GUARANTEE:

All CERTOX products are manufactured according to exacting specifications under personal supervision of I. H. LUTTAN, B. S. A., Entomologist.

SPECIAL CONTRACT PRICES Available to Cover your Annual Needs.

YORK CHEMICAL CO.
Suppliers of Complete Exterminating Chemicals.
424 West 18th Street, New York, N.Y.

CENTROBULBS
12 oz. 8 oz. . . . 4 oz.

From experimental stage to perfection.

Better than pre-war.

Bulb made of synthetic rubber.

Works better, lasts longer, snappier.

Oil and grease resisting.

Perfect invisible seams.

Nozzle made of heavy die-cast metal with cut threads.

Wire screen restored.

Large opening for quick refilling.

Made to form-fit hand of pest control operator.

In dozen lots or more of a size

12 Oz.	$9.00 doz.
8 Oz.	7.20 doz.
4 Oz.	3.00 doz.

F. O. B. New York

Central Rubber Products Co., Inc.
821 Broadway New York 3, N. Y.

Patent Office in issuing the patent has declared Charles V. Sparhawk to be the Original, First and Sole Inventor of the Process Claims mentioned therein.

DDT SPRAY ANTIFREEZED

Specifications for DDT spray developed by the Quartermaster Corps to control roaches, flies, mosquitoes, bedbugs, ants and other insects have had to be changed by the War Department because of a tendency of the spray to crystallize at low temperatures.

Kerosene is the vehicle used in the spray solution of the department and while this has proved satisfactory in warm climates, the spray became almost useless when kept in unheated storage or subjected to the cold of the northern areas. The difficulty was found to be overcome by adding 15 per cent of a special menthylated naphthalene to the kerosene. The new formula shows no crystallization at temperatures as low as 20 degrees below zero.

The specifications have been revised to require the inclusion of this substance in all future purchases of DDT sprays by the QM.

—*O. P. D.*

CHEMICAL IMPREGNATION OF TREES AND POLES FOR WOOD PRESERVATION, by B. H. Wilford, Entomologist, Division of Forest Insect Investigations, Bureau of Entomology and Plant Quarantine, Agricultural Research Administration. Circular 717, United States Department of Agriculture, December, 1944. For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. (10c, in cash).

ARMY'S FAMED "BUG BOMB" ON CRITICAL LIST; QUARTERMASTER CORPS ASKS PRODUCTION SPEED UP

Manufacturers who are producing the Army's invaluable "mosquito bombs," one-pound cannisters of vaporizing liquid which have contributed largely to the control of malaria among American troops in tropic areas, have been requested by The Quartermaster General, Major General Edmund B. Gregory, to concentrate on increased output measures.

Production schedules of "insecticide, freon, aerosol," official title of the handy insect-control weapons, are approaching the critical stage, according to the Office of The Quartermaster General, whose responsibility it is to procure the "bombs." Chief difficulty experienced in the manufacture of the "mosquito bombs" has been procurement of the steel container in which the chemicals are packaged.

JAP BEETLES TRAPPED WIDELY

The Japanese beetle was trapped last year in 18 states outside those already under Federal quarantine. This campaign extended from Florida to the Canadian border, including states as far inland as Missouri. In 1944, east of the Mississippi, the U. S. Department of Agriculture set out nearly 70,000 beetle traps in more than 400 towns and cities. Results of the season's trapping were made known to plant pest officials of the cooperating states, so that they could act to eradicate or suppress the beetle before it has a chance to increase and cause widespread damage to crops, flowers, lawns and golf courses.

KENYA PYRETHRUM

With one of the largest pyrethrum crops in the history of Kenya Colony, East Africa, now being released into war channels, plans are under way for more intensive peacetime cultivation of the daisy-type flower which is the source of pyrethrins, base of most of the effective pre-war insecticides made in America, has been announced by George E. Nixon, on behalf of the Kenya Farmers' Association Co-operative, Ltd. He further states:

Except for a small amount not suitable for war use, the entire Kenya output of pyrethrum has been taken over for the Military requirements.

Under the stimulus of the British Ministry of Supply which has contracted for the entire crop of the Kenya farmers, more than 50,000 acres are now under cultivation. Vast tracts of additional East African acreage are available for future plantings.

It is no secret that before the War the Kenya pyrethrum farms had produced, annually, as much as 14,000,000 pounds of the flowers containing the poison which is the deadliest known enemy to most forms of insect life but which is harmless to human beings and to warm-blooded animals.

Discussing possible post-war competition from Japanese farmers, Mr. Nixon declared that it has been established that the pyrethrum flowers grown in Kenya not only pan out 50% more pyrethrin content than their Oriental counterparts but the East African perpetual summer climate produces more or less continuous harvests as compared with a single Japanese harvest. Since freshness is an important consideration with pyrethrum, the Kenya product, it is emphasized by Mr. Nixon, offers this additional strategic advantage.

MOUSE AND MEN: From the log of a Flying Fortress radio operator on mission to Germany:

"1015 hours; altitude zero. Noticed mouse in radio room. 1150 hours; 10,000 feet: crew taking oxygen. Mouse okay. 1310 hours; 22,000 feet: mouse cold so I'm putting him in my heated muff. He's pretty drowsy. 1325 hours; 25,000 feet: mouse unconscious. Fleas show activity. Target bombed. 1510 hours; 20,000 feet: mouse stirring. 1600 hours; 10,000 feet: mouse running around radio room. 1630 hours; altitude zero: gunner just salvoed mouse out of plane. When last seen mouse and fleas were doing okay."

—*Time.*

COOTIE RE-NAMED: For the fighting man's closest companion, known in World War I as the cootie (and not so well known in World War II), doughfoots of the U. S. 80th Division have a new nickname: motorized dandruff.

—*Time.*

GESAROL: That's the material which is now called DDT.

Applied as a spray in solution it not only kills insects then but continues to kill them for months. Visualize a cow barn with the flies alighting on the walls and being killed. Applied in solid form it kills body insects. Perhaps sprinkled in the bedding of some of our lower grade hotels it can reduce the population of cimex lectularius. That's a nice word for bedbugs.

It has been dusted over test areas of forest to kill undesirable insects. Of course desirable ones share the same fate. It has been suggested that some of the smaller South Pacific islands may be rendered almost insectless by our armed forces—in this case armed with DDT.

100 MICE FLY ACROSS COUNTRY.—Ted Steele, orchestra leader, who supplies the Army and Navy with vaccine-producing mice, got a shipment of 100 Webster breeder mice yesterday at LaGuardia Field, N. Y. They came from California and Mr. Steele said he thought they were the first mice to fly across the continent. They had Class 4 travel priority. Mr. Steele took them to his ten-acre farm near Nyack, where he already had 1,000 mice. By June 1, he said, he would be producing 14,000 a week.

A MORE DURABLE WOOD.—Wood, impregnated with arsenic compounds by a new Swedish process, is said to have three times the durability of untreated wood.

INSECTICIDE IMPROVEMENT.—It is reported that insecticides high in hexachloro ethane, such as those used for killing moths and their larva, can be increased in effectiveness by the addition of small amounts of para-chloro bromo benzene, chloro napthalene or para-dichloro-benzene.

A. S. I. Chemical News.

MOTHPROOFING PROTEINACEOUS FIBERS.—Mothproofing of raw furs and other proteinaceous fibers is successfully reported with a saturated solution of sodium chloride (liquor ratio 25:1) containing 1 per cent of formaldehyde and hydrochloric or sulphuric acid. The best results are obtained at a pH of nearly 0.5.

CROP TESTS IN NEW YORK

Arthur J. Heinicke, director of the State Agricultural Experiment Station, at Geneva, N. Y., announced recently that sufficient supplies of DDT have been allocated to conduct field tests with crops in all sections of the state. . . .

Mr. Heinicke emphasized that the potentialities and the limitations of DDT are not fully known, and that while it is very effective against some insects, it seems to be a specific, and does not work on all insects.

This view was supported at Geigy Company, Inc., 89 Barclay Street, N. Y., the first American company to produce DDT and, through its parent company, J. R. Geigy & Co., Basel, Switzerland, first to perfect it and call it to the attention of the United States Army.

Much research remains necessary before the full use and limits of DDT can be determined, company official conceded.

—*N. Y. Herald-Tribune.*

DEODORIZING

Let's be realistic and recognize that while many products purport to deodorize by destroying the objectionable odor, few accomplish that. Let's recognize that most deodorizing consists of covering up one odor with another which, in someone's opinion, is less objectionable.

There are a number of well recognized procedures for deodorizing. One is the treatment of the material which is objectionable with an oxidizing agent, of which a typical example in solution is potassium permanganate and in gaseous form is ozone. Another typical treatment is the use of an alkaline material which may react and form a less objectionable compound. In gaseous form ,about the only one that can be used is ammonia and in solution any of the alkaline salts serve the purpose. But this is not a recommendation because if you have a mercaptan, ammonia will only make it worse.

For removal of gaseous odorants, sorbents are often employed, examples being activated carbon and silica gel. They remove the odor from a gas provided it comes into contact with it but standing a container of such material in the corner of a large room cannot be expected to contact all of the air in the room. They work well on air-conditioning systems.

Many odors are caused by decomposition which is usually due to an organism, either a plant type known as a fungus or yeast, or an animal type known as a bacterium. A typical gaseous agent for this purpose is formaldehyde and a typical agent in solu-

(Continued on Page 34)

Wiping Out Wasps

Unlike 1943, this is very much a wasp year in Britain. From many districts have come reports of "plagues" of wasps and complaints of annoyance and damage caused by them. Wasps are not wholly harmful; indeed, they do a great deal of good, since not only are they scavengers but they kill house flies and other insect pests. But from July onward at fruit farms, in orchards, jam factories, and in households they can be a nuisance or even a danger.

In districts where wasps are too plentiful, Britain's Ministry of Agriculture has announced preventive measures. According to the Ministry's experts, something may be achieved by trapping, but trapping by itself is not of much use. The best course is to go straight to the seat of the trouble and deal with the wasps in their nests. These may be found in a variety of situations but most wasps' nests will be found below ground and their entrance tunnels may be easily located by watching the general direction of the wasps' flight.

Once a nest has been located, destruction of the inhabitants is easy, provided one goes about it the right way and can get a small quantity of one of several chemical substances. In the first place, destruction should never be attempted by daylight but only at dusk when wasps are at home and are quiet.

Cyanide mixtures are sold under proprietary names and are suitable for the purpose. An ounce or so should be placed as far as possible into the opening of the nest and the hole tightly blocked with a turf or clay. Or a small lump of sodium cyanide may be used in the same way. It cannot be too strongly emphasized, however, that the cyanides are deadly poisons and readers are advised to leave such "remedies" to experts. Carbon disulphide (if it can be procured in these days of short supply) is obtained in liquid form. Half a gill—not more—will be enough. The liquid should be poured into the entrance and the hole well plugged. It should be noted here that carbon disulphide is a dangerous substance to use, being both poisonous and highly inflammable. The utmost care should therefore be taken in using this substance.

Tetrachlorene may be used in a similar manner, but precautions should be taken not to inhale the fumes. Alternatively, tar or creosote may be used. Pour it well into the hole or introduce it by way of an old rag, well saturated, and push tightly home with a stick. Another method is to put in a lump of carbide, wet it and plug the hole as before.

Some species of wasps build hanging nests which they suspend from the branches of trees, etc., and these present a much more difficult problem. In pre-war days such nests were often destroyed by two men working together, one man carrying a bucket of paraffin and the other a lighted torch. The operation called for considerable dexterity and nicety of timing and usually involved some degree of risk. In wartime, of course, it is out of the question. It would be advisable in any circumstances to secure the services of an expert to destroy a nest of the hanging type.

A GOOD JOB DONE

PER-MO-BITS

Scientifically Prepared For

RATS-MICE-MOLES

Made with tested Red Squill

A product that is effective, dependable and ready to use.

Safe to use—non-poisonous to humans, pets, domestic animals, etc.

A try sample size for $1.00—send for one today.

Packed 8 oz., 16 oz. or bulk.

4 to 1 Concentrate FOR RATS AND MICE

(Just Dilute With Water)

Per-Mo Rat and Mice Liquid can be used as a drink or can be mixed with any food and used as a bait.

ECONOMICAL TO USE

Send $1.00 for a 16-oz. Bottle CONCENTRATE RAT & MICE LIQUID. Postage Prepaid.

PENETRATE—

YOUR TERRITORY WITH THE

MOTHPROOF LIQUID THAT "PENETRATES"

Now that woolen conservation is so vital to "UNCLE SAM'S" war program, there is still greater need for Moth protection. You can help "America" protect its valuable woolen materials by selling "PER-MO" Mothproofing Service. Full particulars and prices first letter.

Per-Mo. Mothproof Company

3729 Virginia Ave. **Kansas City 3, Mo.**

New Permanent Termite Control System

A pipe sprinkler system, designed, it is stated, to provide positive, definite, life-time termite control in new construction as long as annual service is maintained, has been announced. Patented by W. B. Hill of the Hill Termite Control Systems, 20 S. Third Street, Memphis 3, Tenn., the system, which will go into production as soon as materials are available, operates as follows:

A permanent, half-inch slotted pipe is built into new homes at time of construction, particularly in sections which will be inaccessible. Once a year the operator will insert a pipe into the installed pipe with corresponding perforations. Toxic chemicals are forced in under pressure; gas is emitted which kills all termites but is harmless to humans. It is estimated the system would cost 2% of price of homes under $5,000.00 and 1% for those over. Yearly service fee, backed by guarantee, would be $10.00.

Individual or company home builders, contractors or any one else will not be permitted to purchase any of these systems. No one but the termite control operator will be authorized to sell and install them and then only in the city in which he operates. There will be no exclusive dealers or exclusive agencies.

Termite control operators everywhere, interested in learning more about this new permanent method of termite control and its sales potential, are invited to write Mr. Hill, care of the above address.

The Hill Termite Control Systems will not sell or recommend any particular chemical. Chemicals furnished by any standard chemical house will be effective in this system.

DDT Saves Colonial Coach at Amherst

Amherst, Mass., March 7th—DDT has made another insecticidal conquest, saving a famous stagecoach, owned by the Amherst Historical Society, from destruction by moths.

The rescue has been reported by Dr. A. I. Bourne, Research Professor of Entomology at Massachusetts State College to Dr. W. C. O'Kane, who has directed DDT tests at the Crop Protection Institute, Durham, N. H. Dr. Bourne has written:

"We received a request from the librarian of The Jones Library for assistance in checking clothes moths in the furnishings and upholstery of an old stagecoach which the library was housing in its basement. It is an excellent specimen and in a remarkably fine state of preservation. It bears considerable historical interest and is known to have been on the regular circuit between Springfield and Worcester.

"The stagecoach in its day carried rather unusual equipment. Instead of the usual leather-covered cushion, it is equipped with plush and velvet and the appointments are in proportion. It was evidently a deluxe model.

"It was found that all the plush and velvet upholstery had been attacked by clothes moths. The insects were breeding there in considerable numbers and the extent of their ravages was becoming quite apparent. Furthermore, the moths had been spreading into other parts of the library, which is equipped with very valuable rugs, tapestries and table covers.

"A supply of Neocid (a DDT composition) was furnished to the library. Approximately one gallon was used for the coach and accompanying furnishings. Several weeks later the librarian reported that there had been no further evidence of clothes moths since the application."

BOOKS

Please remit check with order as this will save additional expense and time.

A list of new books includes:

People
Price $2.50 plus 15c postage

Chemistry of Insecticides and Fungicides
Price $4.00 plus 15c postage

Manual for the Study of Insects
Price $4.00 plus 15c postage

Step Out and Sell
Price $1.50 plus 15c postage

Helping People Buy
Price $2.50 plus 15c postage

Strategy In Selling
Price $6.00 plus 20c postage

Outlines of Entomology by Dr. Imms
Price $3.75 plus 15c postage

"A Manual for the Study of Insects"

This book of 401 pages and 688 illustrations is now in the twenty-first edition. Much space is given to accounts of the life histories and habits of insects. By means of the illustrations and analytical tables it is possible to determine the identity and classification of the common North American insects.

The Book Sells for $4.00 plus 15c postage.

Virus Diseases in Man, Animal and Plant

A survey and reports covering the major research work done the last decade.

The book gives a survey of the monetary status of virus investigation with special consideration of the most recent literature, especially foreign. One of the most important books of its kind offered.

Price $5.00 plus 15c postage

Unbidden House Guests

By DR. HUGO HARTNACK

The volume discusses about 2,000 house guests. It consists of 4 parts:

I. General Part: What are housepests today? Borderlines of Housepest field. Climate of the House. Housepests worldwide. Influence of the house on the housepest. Spoorology (Diagnostic) of Housepests. Damage by housepests (54 pages of pictures). Pests and Wastes. Fighting housepests outdoors. Exterminating methods. Formulae. Pages: 238.

II. Plants as Housepests. Bacteria, Molds which live in the house. Timber rot, fungus. What plants do to housepests and what housepests do to plants and plant products. Pages: 62.

III. Lower Animals. Protozoa, worms, snails, millepedes, spiders, mites, many others, as far as they are housepests. Pages: 112.

V. Backboned Animals. Chordata, coldblooded and warmblooded. Rodents, rats and mice take 56 pages. Formulae, Index. Pages: 148.

Price $12.00, plus 25c postage

WRITE FOR THESE BOOKLETS

The latest helpful information service literature will be sent to you without cost or obligation. If, in addition, there are any particular pieces of literature offered by advertisers in this issue you are interested in receiving, either write them direct, or if you prefer, please send us such requests.

Please note, however, that you must request each booklet on a separate letterhead though they may all be mailed in one envelope addressed to Pests, 126 Lexington Avenue, New York City, N. Y.

ODORLESS DEODORANT—This all-purpose home and commercial deodorant, it is stated, kills odors by absorption, not by superimposing another odor. It is also stated to be non-toxic, non-poisonous, non-caustic, non-inflammable, non-corrosive and harmless to man, animals and birds. Effective in the elimination of offensive odors.
WRITE PESTS—X-ODOR.

Fortified Red Squill circular, which includes bait chart, describes a Fortified Red Squill powder activated and standardized to meet recommendations of the Fish & Wildlife Service for a minimum lethal dose of 500/600 mg/kg of rat.
WRITE PESTS—PRENTISS.

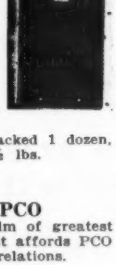
CONTROL OF TERMITES-POWDER-POST (LYCTUS) BEETLES-DECAY

Circular discusses properties and uses of Permatox A in termite control and its application to soil and wood to control termites, decay control, powder-post beetle prevention and control. Description of Permatox T and its uses in termite control, as a soil poison, are also discussed, together with toxicity.
WRITE PESTS—BULLETIN 43-T.

Inquiries invited from pest control operators interested in New Big 6 Line of Wizo Moth Killer Vaporizers and Crystals. Catalog describing each product fully and prices available.
WRITE PESTS—ELKAY.

VICTOR GLADIATOR METAL RAT TRAP

The Victor Gladiator Rat Trap is made of 22 Gauge Steel, Gun Metal finish. Equipped with strong double-coil spring made of 15 gauge oil tempered spring wire, heavy wire work throughout. Note holes in base for nailing to floor, rafters, or wall.



The Victor Gladiator has been designed especially for professional use by public health officers, sanitary officers of the armed forces, and pest control operators. It is of rugged construction and is particularly adapted to outdoor use; especially recommended for the tropics and on shipboard, not readily affected by continuous contact with moisture.

Actual size 7⅛x3⅝x1½". Weight, packed 1 dozen, 4½ lbs. Weight, packed 6 dozen, 29½ lbs.
WRITE PESTS—VICTOR.

FILM OF VALUE TO PCO

Circular describes a vivid action film of greatest value to every PCO and opportunities it affords PCO to build good will and better public relations.
WRITE PESTS—WIL-KIL.

ANT BAIT

Circular describes a jelly ant bait with Thallium Sulphate as its toxic ingredient. Comes packed in sizes convenient for resale or professional use. Sample tube on request.
WRITE PESTS—LETHELIN.

Phosphorous Paste killing power; baits, combinations, amounts for the control of roaches, mice, rats are discussed.
WRITE PESTS—OPITZ.

FUMIGATION SAFETY RULE

A review of fumigation accidents of record for 1943 shows that oversight or disregard of rule to lock all doors and accessible windows, failure to place warning signs thereon and failure to post guard during fumigation account for approximately 20% of the accidents. Bulletin discusses ways and means to eliminate accidents of this nature.
WRITE PESTS—AC No. 80.

PRESERVATION OF MILLWORK AND OTHER DRY WOOD PRODUCTS

Bulletin discusses composition of Permatox B Concentrate and its application in the preservation of millwork and other dry wood products.
WRITE PESTS—PERMATOX 43-B.

SODIUM SILICO FLUORIDE

Bulletin describes sodium silico fluoride product with proper density. Effective manner of testing for presence of HCN after ventilation also discussed.
WRITE PESTS—AC 70.

Fumigation manual. 76-page manual describes safe handling and working with "Cyanegg" and on fumigation procedure and insect control. Illustrated.
WRITE PESTS—DuPONT.

GAS MASKS—RAT CONTROL PROGRAMS

Bulletin offers some pertinent suggestions regarding gas masks and how to keep them in perfect condition. It also discusses rat control programs and what the PCO can do to further them.
WRITE PESTS—AC 82.

THE ACTIVATING EFECT OF PYRETHRUM UPON THE GERMAN COCKROACH

Research material prepared by John M. Hutzel, of the Ohio State University, Columbus, Ohio in cooperation with the Kenya Pyrethrum Extension Service, Inc., N. Y. Supervised by Professor F. L. Campbell.
WRITE PESTS—PYRETHRUM.

THE MODERN TREATMENT OF CYANIDE POISONING

This brochure, written by KK. Chen, M. D., Charles L. Rose, B.A., and G. H. A. Clowes, Sc.D., and reprinted from the Journal of the Indiana State Medical Association, discusses The Modern Treatment of Cyanide Poisoning. Contents include: Sources of Poisoning and Mortality Statistics; Diagnosis; The New Treatment; A Suggested Procedure for Actual Treatment; Results to Date, etc.
WRITE PESTS—A-C CYANIDE.

NEW EDITION FUMIGATION MANUAL NOW AVAILABLE

The new edition of the Fumigation Manual pertaining to the use of Aero Brand HCN Discoids is now off the press. Every PCO should have one on hand as it is a ready reference and contains helpful and valuable information and suggestions.
WRITE PESTS—A-C MANUAL.

INSECT TRAPS

Bulletins describe traps for ants and roaches, with suggestions for their use.
WRITE PESTS—SOILICIDE.

RAT GLUE AND BOARDS CIRCULAR

RAT GLUE AND BOARDS CIRCULAR discusses use of rat glue boards as a means for effective rat control, etc.
WRITE PESTS—ELKAY.

PYRETHRUM - DERRIS - RED SQUILL PRODUCTS

Leaflet describes foregoing insecticides with special bait chart for use in connection with powdered red squill.
WRITE PESTS—PRENTISS.

RATS CAN'T RESIST THE NEW BAIT

VEGEX
DRY
GRAVY
as effective
as the best beef

Simply add water—boil up once—add poison—and it works like magic. Keeps indefinitely—needs no refrigeration. Safe to use.

One five-pound package makes five-gallon mixture—costs only four dollars. Four five-pound packages—fifteen dollars. Available in five-pound packages only.

VEGEX COMPANY
175 FIFTH AVENUE NEW YORK 10, N. Y.

Red Squill Rat and Mouse Killer

Booklet describes Red Squill rat and mouse killer made up in convenient package form for resale to public. Also illustrated are resale packages of dog repellent, moth killer, etc. Included in the booklet is reprint of an article on Red Squill by Leonard R. Parkinson, Agr. Exp. Station, Massachusetts State College.

WRITE PESTS—OHIO.

CALCIUM CYANIDE FOR RAT CONTROL

36-page booklet contains excerpts from official publications and reports of health officers throughout the world regarding use of calcium cyanide in the control of rats. The widely differing conditions surrounding infestations, and the specific types of control for each, which are described, will serve as suggestions to health officers and others in solving similar problems.

WRITE PESTS.

FUMIGATION SAFETY RULE

Bulletin discusses importance of personal inspection of entire premises immediately before releasing gas, and offers some constructive suggestions with respect thereto.

WRITE PESTS—AC 81.

NEW ANT TRAP

Manufacturer claims many new features such as no turning or twisting necessary; four openings; larger trap; contents ½ greater than any other competitive brand.

WRITE FOR YOUR FREE SAMPLE OF ANT TRAP TO NOTT, c/o PESTS.

INSECT POISONING AGENTS

"Thanite, quick death to insects" is a 12-page booklet presented in Basic English with a view to international use. It discusses the development and applications of the product.

WRITE PESTS—HERCULES.

ELECTRIC FANS HAVE SEVERAL USEFUL FUNCTIONS IN FUMIGATION WORK

Ways in which fans may be used to promote circulation and penetration of gas during fumigation are described in this bulletin.

WRITE PESTS—AC 84.

BIRD REPELLENT

Circular describes product which manufacturer claims will serve as an effective repellent against pigeons, starlings, bats, dogs, cats, rats, mice, woodchucks, moles as well as crawling and flying insects that prey upon plantings and seedlings.

WRITE PESTS—PX.

BOX CAR FUMIGATION

Folder describes box car fumigation with methyl bromide, giving details as to: car seal, applicator arrangement, methyl bromide application, dosage, exposure period, temperature, aeration, precautions.

WRITE PESTS—DOW.

PRESERVATION OF LUMBER, POLES, POSTS, PLYWOOD WITH PENTACHLORPHENOL

This bulletin gives a brief summary of the properties, use to date, and recommendations for the preservative treatment of lumber, poles, posts, and other forest products with Permatox A. This product, it is stated, has shown outstanding promise as an effective and permanent oil preservative for many wood products. Set forth briefly also, are recommendations for the effective preservative treatment of lumber, poles, posts, and other forest products with Permatox A, based upon experience to date.

WRITE PESTS—BULLETIN 43-A.

PIGEON-PROOFING

Folder describes pigeon-proofing invention which manufacturer claims will completely and decisively eliminate the pigeon nuisance. In use by real estate companies, churches, government buildings, etc.

WRITE PESTS—STANLEY.

FIRST AID AND TREATMENT FOR METHYL BROMIDE EXPOSURE

This valuable booklet, prepared by Dr. H. H. Gay, Medical Director, The Dow Chemical Company, Midland, Mich., outlines first aid and treatment for Methyl Bromide exposures. Contents are based upon what is believed to be sound medical practice. Digest follows: properties of Methyl Bromide, symptoms of Methyl Bromide exposure, first aid, suggested treatment by a physician, skin contacts with Methyl Bromide. Copy may be had by writing Dow direct, or

WRITE PESTS—GAY.

SAFETY IN FUMIGATION WORK

Fumigation Safety Rule No. 1; namely, "Vacate entire building even though only part is fumigated, as well as adjoining buildings into which gas may penetrate" is discussed in this bulletin.

WRITE PESTS—AC No. 78.

SOLVAY PRODUCTS

48-page booklet in colors and illustrated, covering their entire line of Alkalies and Special Products, with a special section dealing with Para-Dichlorobenzene and Ortho-Dichlorobenzene.

FREE COPY MAY BE HAD BY PEST CONTROL OPERATORS.

WRITE PESTS—SOLVAY, c/o PESTS.

LETHANE A-70

Folder discusses roach, ant and bedbug powders based on this new insecticide concentrate. Described are: safety factors, cost per application, killing power, performance data, residual activity, tenacity, etc.

WRITE PESTS—A-70.

SPECIAL ROACH POWDER

Circular describes a roach powder (containing Lethane A 70) which, it is stated, is fast acting, positive in kill and will not deteriorate for at least eight weeks after application. As a result, the supplier points out, the PCO does not have to service his customers as often, thereby conserving manpower. Moreover, it is stated, the powder is non-toxic to warm-blooded animals and may, therefore, be used in dairies, packing and food handling plants, homes, etc., in fact, in all places where sodium fluoride mixtures may not be used. . . . Described also is a sodium fluoride-Pyrane formulation for the PCO who wishes to make his own roach powder.

WRITE PESTS—BOSLEY.

SYNTHETIC ROACH POWDERS

Research material apropos thiocyanates in powdered form for roach control in place of pyrethrum—describes the development and properties of roach, ant and bedbug powder based on Lethane A-70.

WRITE PESTS—SYNTHETIC.

MILITARY FUMIGATION MANUAL

This special 48-page manual has been prepared for the benefit of officers and civilians in the Armed Forces who are responsible for vermin control, and for PCOs who may contract with the Armed Forces for fumigating work. Among other subjects, the manual discusses: dosage, preparation of building for fumigation, fumigation operation, common pests, cockroach control; precautions, first aid methods, etc.

WRITE PESTS—AC.

TERMITE CONTROL

Folder discusses concentrates available for two distinct methods of termite control: (1) treatment of timbers in place with an oil solution, and (2) treatment of all soil around an infested building or area with either an oil or water soluble chemical. Issuing company states it specializes in all problems concerning wood-destroying organisms and also wood preservation and invites your inquiries thereto.

WRITE PESTS—WOOD.

FUMIGATION SAFETY SUGGESTIONS

Of timely interest, in view of the at-hand fumigation season, is this bulletin which advocates as a safety measure the use of methyl orange-mercuric chloride test papers for the presence of HCN. It also discusses can openers for Zyklon Discoids, the need for adequate ventilation after fumigations, and gives a cautionary note on pilot lights in premises to be fumigated.

WRITE PESTS—AMERICAN.

STERILIZING GAS MASKS

News bulletin describes a chemical that is claimed by the manufacturer to be effective in sterilization of gas masks. Bulletin also discusses antidotes and first aid, particularly an inhalant which functions best as an antidote to HCN poisoning, and where obtainable.

WRITE PESTS—AC-73.

ALL-PLASTIC GOGGLE

Circular describes a new lightweight, all-plastic goggle which provides comfortable, durable protection for the eyes. The individual eye cups are moulded to fit the facial contours, giving a close yet comfortable seal around eye orbits, according to the circular. Particularly useful for spraying in termite control, as well as heavier bedbug spraying operations, to prevent direct sprays from getting into the eyes themselves—available in different models.

WRITE PESTS—MINE.

FUMIGATION AND PLASTICS

News release discusses use co-ordination of such diverse chemical products as plastics and fumigants in connection with infested bagged grain, seed, packaged or boxed foodstuffs. Methyl bromide-plastic-tarpaulin method of disinfestation described.

WRITE PESTS—DOW.

RESPONSE OF RATS MAINTAINED ON DIETS FUMIGATED WITH METHYL BROMIDE

Research material reprinted from Food Research

WRITE PESTS—DOW-RESEARCH.

DEODORANT

Catalog includes price data, etc., on deodorant which it is felt can neutralize and deodorize such toxic agents as Thanite, Lethane 384 Special, Velsicol, etc. Also contains data on perfume oils for sprays made with pyrethrum and kerosene.

WRITE PESTS—MAGNUS.

ELECTRIC FANS

Bulletin discusses value of electric fans in connection with fumigation work, also some pertinent thoughts on the Schafer Prone Pressure Method of Resuscitation, etc.

WRITE PESTS—AC-69.

NEW RAT BAIT

The current difficulty of procuring rat baits because of meat rationing has been overcome by the discovery on the part of numerous PCO's of Vegex Dry Gravy, states its manufacturer.

This product with a delicious meat flavor, and high in hydrolized vegetable protein seems to be an irresistable lure for rats, according to the same source.

It has many advantages. It is instantly prepared by simply adding water and boiling up once.

The prepared bait can be handily carried in the kit, and the bait need never be touched, as bread can be dipped in the poison mixture by tongs. Keeps indefinitely and needs no refrigeration, it is stated.

Results with Vegex Dry Gravy have been so good in rodenticide work, and the Gravy is so inexpensive and easily handled that PCO's who have used it are expecting, according to the supplier, to continue even after war rationing is a thing of the past.

The Vegex Company, located at 175 Fifth Avenue, New York 10, N. Y., puts up this Dry Gravy in 5-pound packages only. One 5-pound package makes 5 gallons of finished Gravy. Prices and other pertinent data on Vegex Rat Bait may be had by writing the company.

ANIMAL ODORS AS REPELLENTS AND ATTRACTANTS

Incorporation of the glandular extraction of the skunk into commercial repellents to add to their potency and efficacy is discussed in an interesting article, entitled "The Odor of an Enemy, the Cat, Frightens Mice Away," by Charles V. Sparhawk. In it he also discusses the use of a small quantity of a muskrat bait in the form of a gland as a powerful attraction to any creature that feeds on meat, such as mosquitoes, flies, ticks, lice, rats and mice, etc.

WRITE PESTS—SPARHAWK.

God made the star-hung skies for us,
The whispering trees, the hills, the lakes.
Of course He made mosquitoes, too—
But everybody makes mistakes.

—National Geographical.

At a depth of 240 feet, water pressure is so great it will keep a cork from coming to the surface.

Business Opportunities
(Classified)

RATES — For individuals seeking employment, 5c per word, minimum $1.00. All others 10c per word, minimum, $2.00. All advertisements must be in the hands of the publishers seven days before publication date and must be accompanied by cash or money order for payment in full. The publishers are not responsible for any false or misleading advertisements.

Replies to advertisements where box number only is indicated should be addressed c/o PESTS, 1200 Oak St., Kansas City 6, Mo., giving box number as well.

Chemist and Exterminator with University Degree wants position as manager of Exterminating firm about May 15th. 12 years experience, 6 years as manager and chemist of one concern. State wages and opportunity.

Box 5, c/o Pests.

MANAGER, SALESMAN, thorough knowledge exterminating, fumigating, termite control business. Manage New England and New York territories for large, reputable firm. $4,000 per year, plus percentage of business. Steady income assured. Write full qualifications, experience, age. All letters held in strictest confidence. BOX 389.

LOCAL ORGANIZATION NEWS

Dallas Pest Control Association

A meeting of the pest control operators was held in Dallas, Texas, February 24th for the purpose of organizing a Local Association. On March 5th another meeting was held at which there took place the election of officers.

C. A. Trimbos of Protex Service, Incorporated was elected President; Bailey Finks of Southern Exterminating Company, Secretary; and A. Bond of the Dallas Termite & Pest Control Company, Vice-President. It is expected that the vacancy of other vice-presidency will be filled by a representative of a firm of Fort Worth, Texas.

The membership of the Dallas Pest Control Association will probably number 25 firms and like the Houston Pest Control Association, will cooperate with the Texas State Pest Control Association and National Pest Control Association. Representing the National Pest Control Association in Dallas is H. O. Abel, Regional Vice-President. At Houston, Texas, representative of the National Association is J. L. Howell, Director.

EFFECT OF HYDROCYANIC ACID ON FOODSTUFFS

This bulletin answers some highly interesting questions as to the effect of HCN on footstuffs.
WRITE PESTS—A-C 89.

THALLIUM PRODUCTS

Circular calls attention to ant traps and jelly bait for control of ants—house or garden; mice seeds, rat paste, etc.
WRITE PESTS—NOTT.

RESPIRATOR

Bulletin discusses "Clear-Vue" model Dustfoe Respirator, which it is stated is durable, odorless, non-corrosive and a non-conductor of electricity and heat and gives a proved protection against toxic dusts.
WRITE PESTS—DUSTFOE.

HYDROCYANIC GAS MASK

Bulletin describes Hydrocyanic gas mask with all-vision facepiece.
WRITE PESTS—MINE.

NEW PERFUMING PRINCIPLE FOR INSECT SPRAY TOXIC AGENTS

Perfume Oil Fruit Berry MM&R is called the first new and different neutralizer-perfume in a decade, by Magnus, Mabee & Reynard, Inc., New York essential oil house.

Perfume Oil Fruit Berry MM&R not only neutralizes the odor of toxic agents, but imparts a truly refreshing fragrance of uncommonly light character. It has a definite fruity scent. A remarkable feature is that it has so light a fragrance, yet has the hiding power to give lasting coverage of heavy odors. This feature will be of particular interest for sprays used in food plants, bakeries, etc.

Fragrance of sprays, up to now one of the unmentionables of insect toxicants, now becomes an asset instead of a liability. Samples may be had by writing PESTS—MABEE.

FUMIGATION SAFETY RULES

Bulletin discusses fumigation safety rules with respect to mattresses, pillows, bedding, clothing and bedroom rugs, etc.
WRITE PESTS—AC No. 79.

ALABAMA OPERATES STATE-WIDE RAT CONTROL PROGRAM TO STOP SPREAD OF TYPHUS FEVER

An article written by Dr. Andrew J. Perolio, State Director of Typhus Control of the State of Alabama which describes the State's program for stopping the spread of typhus fever.
WRITE PESTS—AC.

INSECT COLLECTIONS

Booklet describes pocket display case which may slip easily into a coat pocket making it of value for salesmen or others who travel about. Life history collections of structural type pests are also available for the PCO.
WRITE PESTS—WARD'S.

Hydrocyanic Acid Poisoning—Skin Absorption

Bulletin discusses some pertinent safety suggestions with respect to avoidance of hydrocyanic acid poisoning through skin absorption.
WRITE PESTS—A-C-74.

CONTINUOUS INTIMATE BLENDING

A bulletin on the intimate blending of fine chemical, food and insecticide powders has recently been issued by Sprout, Waldron & Company, Manufacturing Engineers. In addition to a description of Blending Systems designed for continuous, automatic operation, there is a page of photographs which show the difference between intimate blending and conventional mixing as revealed by typical spatula tests. Copies of this 8-page bulletin in two colors may be obtained from PESTS—SPROUT.

REMOVAL OF PHOTOGRAPHIC FILMS AND PAPERS BEFORE FUMIGATION

is the title of an interesting and informative Bulletin which discusses the effects of hydrocyanic acid vapors upon unexposed photographic film. Other subjects discussed are: "High Temperature Necessary for Winter Fumigation"; "The Rat Menace—An Opportunity to Cooperate."
WRITE PESTS—A-C-88.

Ontario Pest Control Association Organized

An organization meeting of the Ontario Pest Control Association was scheduled for March 19, at the King Edward Hotel, Toronto, Canada. Banquet was to follow with a program of technical subjects after that.

What's New In Pest Control - Personals

(Continued from Page 29)

tion is phenol. One must not overlook the fact that these are active chemical agents and may be effective by reaction as well as by prevention of putrefactive decomposition.

There are a number of other methods. Electrostatic precipitation removes dust particles which may either have an odor themselves or may carry down the gaseous odorant by sorption. Catalytic oxidation has been suggested for the purpose but we have never known that it was employed.

When you finally get around to it, in the last analysis, most odorants cover up one smell with another. We have been very careful not to suggest that this was true of any particular product.

—Adapted from the Givaudanian.

DDT WILL ADD CIVILIAN ROLE TO WAR DUTY SOON

100,000 Pounds of New Insecticide Freed by W.P.B. for Research

One of America's first and most deadly "secret weapons" of this war, the powerful insecticide known as DDT, is about to go on limited civilian duty. The full force of its still unmeasured strength is to be thrown into a battle against mosquitoes, flies, fleas, lice, bedbugs, beetles and other insect enemies of mankind.

The War Production Board has authorized producers of DDT to release about 100,000 pounds of the lethal powder to civilian research agencies during the first six months of 1945.

The potent agent that forced the capitulation of body lice when it was first tried in North Africa, that conquered a typhus outbreak before it could become epidemic in Naples, that swept malarial mosquitoes out of Saipan when American troops went in, already has its civilian duties outlined.

Beginning in March and continuing until June, crews organized by the United States Public Health Service and state public health agencies will visit 300,000 homes in 100 counties of eleven Southern states to spray the houses with a DDT compound.

—N. Y. Herald-Tribune.

WOOD RESISTS FLAME, MOISTURE AND WARPING

Methylolurea (from the combination of dimethylolurea with urea) has the characteristic of making ordinary wood flame-resistant, moiture-resistant, and warp-proof. Sticking doors, windows, and drawers are caused by swelling. Compressing the wood after treatment will completely avoid these inconveniences, although just applying the chemical will prevent jamming.

—Inside News.

SODIUM FLUORIDE

Chemicals and Supplies for the Pest Control Operator

Associated Chemical Industries
Bloomfield, N. J.

STANLEY'S PATENTED PIGEON-PROOFING

Economically, Permanently, Positively and Lawfully from any type of structure.

Stanley's Roofing & Building Service, Inc.
523 West 184th St. New York, N. Y.
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WIZO RAT GLUE BOARDS

Eliminate Use of Poison!
Require No Bait!

A practical and economical way to rid buildings of rodent pests! No hazards of poisoned bait . . . or of decompesition! Easy to prepare! Just place WIZO Rat Boards near rat hole or form a runway next to walls. Fasten boards to floor to prevent pulling away. Rodents are caught firmly the moment they step on the boards.

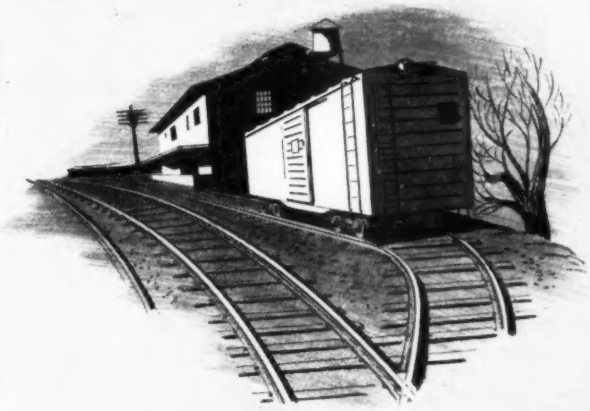
WIZO RAT GLUE can be obtained in quantities for preparing your own boards. Write for complete particulars.

ELKAY PRODUCTS CO.
323-27 West 16th St. New York, N. Y.

Case History*

BOX CAR FUMIGATION OF RICE

Rice Weevil, Confused Flour Beetle and Cadelle Succumb to Dow Methyl Bromide



*Actual record is on file at The Dow Chemical Company

Parked on a siding of a southern rice milling company, a boxcar was holding open house—for unwelcome visitors. It was loaded with rice which had become infested with rice weevil, confused flour beetle, and cadelle. Because the temperature ranged 40° F. and below, fumigation presented a major problem until Dow Methyl Bromide, suggested by an industrial fumigator, was used in the following manner:

Control Measures: Doors were sealed with greased kraft paper.

Dosage and Exposure Period: 24 pounds of Dow Methyl Bromide was used for a 24-hour exposure period.

Method of Application: Cold Methyl Bromide cooled in ice and salt was poured into eight shallow plans placed on top of the load.

Aeration Period: 2 hours.

Results: 24 hours after the fumigation was completed no signs of life could be detected and all evidence indicated a complete kill.

This outstanding job was possible because of Dow Methyl Bromide's ability to operate at very low temperatures. Undoubtedly, this effective fumigant can help you handle tough fumigation jobs. Why not write for further information?

THE DOW CHEMICAL COMPANY, MIDLAND, MICHIGAN

New York • Boston • Philadelphia • Washington • Cleveland • Detroit • Chicago • St. Louis
Houston • San Francisco • Los Angeles • Seattle

The penetrating fumigant

Methyl Bromide

DOW

CHEMICALS INDISPENSABLE TO INDUSTRY AND VICTORY

PLAN TO REPEL THAT SPRING INVASION NOW!

An invading army is converging on all objectives. The attack may be expected at any moment. All resources for defense must be massed against the enemy. Plans must be made AT ONCE to repel this certain invasion.

Check your stocks of HI-TOX, MORTICIDE, SUPER-MORTICIDE, MORTOLIN, ASSCO ROACH POWDER and POWDERED FORTIFIED RED SQUILLS. You will avoid disappointment and consequent operational loss by ordering your SPRING requirements NOW!—You should have at least a sixty day supply of all our products on hand at all times to protect yourself against transportation delays.

If you are still unacquainted with our products, write our office nearest you for samples and data.

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